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MANPOWER, PERSONNEL, AND TRAINING RESEARCH
AND DEVELOPMENT IN THE UNITED STATES
AIR FORCE, 1946-1979

By

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This technical paper has been reviewed and is approved for publication.

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20 ABSTRACT (Continue on reverse side if necessary and identify by block number) This paper is a brief history of the behavioral science research program in the Air Force from 1946 through 1979, the period of professional activity in the Air Force of the senior author. It outlines organizations and personnel from the Aviation Psychology Program of World War II, on through the Human Resources Research Center (HRRC), then the Air Force Personnel and Training Research Center (AFPTRC), then the 6570th Personnel Research Laboratory, to the current Air Force Human Resources Laboratory (AFHRL). It describes principal research themes throughout the period.			

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PREFACE

This brief history of the behavioral science research program in the United States Air Force is relatively complete in its outline of organizations and personnel over the included time. It is grossly incomplete in its reporting of training devices, simulation, manpower modeling, and other efforts outside the classic personnel and manpower research areas. Other reports in those areas were being assembled as of June 1979.

The senior author of this paper recently retired from his position as Technical Director of the Personnel Research Division of the Air Force Human Resources Laboratory. The junior author of the paper, Mrs. Nancy A. Perrigo, is currently serving as the historian for the Laboratory.

The authors are indebted to a number of organizational histories for background material as well as cited materials. Historians in the Aerospace Medical Division (some are not identified), the Human Resources Research Center, the Air Force Personnel and Training Research Center, the Personnel Research Laboratory, and the Air Force Human Resources Laboratory include Mr. John W. Bullard, Ms. Elsie Cole, Lt Charles Dechart, Mr. Homer Hyde, Mr. Howard D. Kramer, Ms. Jane Patterson, Mr. Green Peyton, and Ms. Mazie Simpson. Without the materials provided by these historians, this paper would not have been possible. Although this paper cites the efforts of historians in many of its references, it covers the period of professional activity in the Air Force of the senior author. Therefore, he is solely responsible for any error of fact which may appear in this document. He would appreciate correction or clarification of any such error, in writing, to the attention of the Historian, Air Force Human Resources Laboratory, Brooks AFB, Texas 78235.

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MANPOWER, PERSONNEL, AND TRAINING RESEARCH AND DEVELOPMENT
IN THE UNITED STATES AIR FORCE, 1946-1979

I. ORGANIZATIONAL OVERVIEW

The success of the Aviation Psychology Program of World War II in providing an economical system for identifying potential aircrrew members awakened interest in a post-war program to address personnel management problems for a greater proportion of Air Force personnel. The program grew slowly in the 1940s, leading to the activation on 1 July 1949 of the Human Resources Research Center (HRRC) in the Air Training Command.¹ On 1 February 1954, the Air Force Personnel and Training Research Center (AFPTRC) was established in the Air Research and Development Command.² The AFPTRC expanded to address a broad range of training, personnel management, manpower planning, and personnel selection/classification problems. For a variety of reasons, AFPTRC was disestablished in 1958, leaving a residual research and development program in manpower, personnel, and skills knowledge test development at Lackland AFB, Texas.³ This work was accomplished by the 6570th Personnel Research Laboratory, which was assigned first to the Wright Air Development Center, then to the Wright Air Development Division, then to the Aeronautical Systems Division, and finally to the Aerospace Medical Division (AMD).⁴ The Personnel Research Laboratory provided 9 years of productive effort involving selection and classification programs for officers and enlisted personnel, development of occupational analysis technology, and statistical studies of a growing longitudinal personnel data base.

In late 1966, the work of the Laboratory came to the attention of the Secretary of the Air Force, who sought to "vitalize the manpower/personnel area."⁵ He directed the Air Force Scientific Advisory Board to review the behavioral science program, resulting in recommendations leading to the establishment of the Air Force Human Resources Laboratory (AFHRL) on 1 July 1968.⁶ By 1978 the Laboratory was manned to about one-half the size of AFPTRC, and was working in such areas as personnel, manpower, training, simulation, and the mathematical modeling of personnel and logistics systems.

II. FOUNDING FATHERS--KEY PERSONNEL BY ORGANIZATION OF ASSIGNMENT

The World War II program was carried into the post-war environment by two organizations: the Medical and Psychological Examining Unit (MPEU) at Keesler Field, Mississippi, and the Psychological Research Project (Pilot) at Randolph Field, Texas.⁷ The MPEU was directed by Capt Reuben A. Baer, assisted by Mr. Frederick H. Rohles and Mr. Howard Madden. At the Psychological Research Project (Pilot), Capt John T. Dailey was the Director, and Dr. John T. Cowles was the Technical Director. Their staff included Dr. Robert J. Keller, Mr. Robert Unger, Mr. Leland D. Brokaw, Miss Iris Hart, and Capt William V. Hagan.⁸

On 1 May 1946, MPEU was disestablished and became the Psychological Research and Examining Unit (PREU) at the Army Air Force Military Training Center (AAFMT) at what is now Lackland AFB. One officer, two civilian aviation psychologists, and 14 enlisted men were transferred to AAFMT to form the new unit. The Director was Capt Baer.⁹

The Psychological Research Project (Pilot) was redesignated Aviation Psychological Research Unit Number 1 (ARPU Nr. 1) in October 1946.¹⁰ Dr. John T. Cowles was designated as Director, with John T. Dailey, then out of the military service, as his deputy.¹¹ On 13 January 1947, ARPU Nr. 1 was merged with PREU; Capt Reuben A. Baer continued as Director of PREU, and Dr. John T. Cowles was named Director of Research.¹² In July 1948, Dr. Dailey became Director of Research, when Dr. Cowles was appointed Vice President in Charge of Research for the Educational Testing Service, in Princeton, New Jersey.¹³ In August 1948, the PREU was redesignated as the 3309th Research and Development Group, which was redesignated as "Squadron" later in the same year.¹⁴

Chronology and Key Personnel of these early organizations are found in Appendix A.

III. HUMAN RESOURCES RESEARCH CENTER

The Air Training Command Human Resources Research Center (HRRC) was established in July 1949, based on the 3309th Research and Development Squadron.¹⁵ As of 30 June 1950, it was commanded by Col John T. Fitzwater, with Dr. Arthur W. Melton as Deputy for Research.¹⁶ The Center included the Directorate of Personnel Research at Lackland AFB, with Dr. John T. Dailey as Research Director and Capt Glen E. McClure as the senior military officer;¹⁷ the Perceptual and Motor Skills Research Laboratory, also at Lackland AFB, with Dr. Robert Gagne as Research Director and 1st Lt F. W. Beekman as the senior military officer;¹⁸ the Directorate of Pilot Training Research at Randolph AFB, Texas, commanded by Lt Col V. J. Donahue;¹⁹ the Directorate of Bombardment Observer-Navigator Training Research at Mather AFB, California, with Dr. Edward H. Kemp as Research Director and Maj C. W. Head, Jr. as the commanding officer;²⁰ and the Directorate of Technical Training Research at Chanute AFB, Illinois, with Dr. Thomas W. Harrell as Research Director and Lt Col Richard W. Faubion as commanding officer.²¹

The organizational breakouts, as of 30 June 1950, and key personnel for each agency appear in Appendix B, Part I. In August 1950, Col Clark L. Hosmer replaced Col Fitzwater as HRRC Commander.²²

The Center was growing, but reasonably stable, through 1950; by which time it consisted of Directorates of Personnel Research, Pilot Training Research, and Technical Training Research, as well as a Perceptual and Motor Skills Research Laboratory.²³ (Later, in 1951, the "Directorate" designations were changed to "Laboratory" for all of the HRRC research agencies.)²⁴

On 27 March 1951, new capabilities were introduced in HRRC in the form of a Flexible Gunnery Training Research Laboratory at Lowry AFB, Colorado, and a Combat Crew Training Research Laboratory at Randolph AFB.²⁵ In December

1951, the Air Defense Personnel and Training Research Laboratory was established at Ent AFB, Colorado,²⁶ but it was later (June 1952) consolidated with the Aircraft Observer Training Research Laboratory at Mather AFB, California.²⁷ The Pilot Training Research Laboratory had been moved, in October 1951, to Goodfellow AFB, Texas, when basic pilot training was discontinued at Randolph.²⁸

Col Hosmer remained HRRC Commander until July 1951 when he was replaced by Col Stebbins W. Griffith.²⁹ The organization had continued to grow rapidly. It increased from 439 manpower slots as of June 1950 to 1,180 slots in December 1951.³⁰ As of 30 June 1952, Dr. Arthur W. Melton was Director of Operations, and Dr. Charles W. Bray was the Deputy Director for Research.³¹ Among the Center's Directors of Research were Dr. Robert M. Gagne, Perceptual and Motor Skills Research; Dr. Lloyd G. Humphreys, Personnel Research; Dr. Edward H. Kemp, Aircraft Observer Training Research; Dr. Robert L. French, Combat Crew Training Research; and Lt Col William V. Hagin, Pilot Training Research.³² A complete listing of task scientists and key personnel as of 30 June 1952 appears in Appendix B, Part II.

Thus, in mid-1952, HRRC consisted of seven laboratories and six field sections.³³ On 27 November 1952, yet another reorganization occurred when numbered Research and Development Groups (Laboratories) and detachments were designated. There were seven groups and four detachments. The groups coincided with the previously existing laboratories, except that the Flexible Gunnery Training Research Laboratory at Lowry AFB had become the Armament Systems Training Research Laboratory. The 3306th R&D Group (Pilot Training Research Laboratory) opened a detachment at Williams AFB, Arizona; however, it was later moved to Tyndall AFB, Florida. The Personnel Research Laboratory at Lackland AFB became the 3300th R&D Group, with detachments at Sampson AFB, New York, and at Parks AFB, California.³⁴

In August 1952, Col Herbert N. Cowles replaced Col Griffith as HRRC Commander. As of 31 December 1952, Dr. Melton was the HRRC Technical Director.³⁵ On 1 April 1953, the units of HRRC were removed from Air Training Command and assigned to the Air Research and Development Command, with no change in manning or station.³⁶

In addition to the redesignation of Dr. Bray as Deputy Chief of Staff, Development, 1 November 1953 saw the merging of the two R&D groups at Lackland. On this date the Personnel Research Laboratory was discontinued and absorbed by the 6561st Research and Development Group, which was named the Personnel and Perceptual Motor Skills Laboratories. The Commander of this group was Maj William Long, and Directors of Research were Dr. Lloyd Humphreys and Dr. Robert Gagne.³⁷ Yet this was only the beginning. Plans were being made for the integration of all human resources research, and by the end of 1953, it was known that the Human Resources Research Center would soon cease to exist.³⁸

Chronology and Key Personnel are shown in Appendix B, Part III.

IV. AIR FORCE PERSONNEL AND TRAINING RESEARCH CENTER

On 1 February 1954, the Human Factors Operations Research Laboratories (HFORL) at Bolling AFB, Washington, D.C., (formerly the Human Resources Research Laboratories and assigned to Headquarters Air Force) and the Human Resources Research Institute (HRRI) at Maxwell AFB, Alabama, (formerly assigned to Air University), now being both assigned to the Air Research and Development Command, were disestablished and integrated with the Human Resources Research Center. These three organizations were reassembled as the Air Force Personnel and Training Research Center (AFPTRC).³⁹ In addition to the Personnel Research Laboratory and Skill Components Research Laboratory at Lackland AFB, AFPTRC also included seven laboratories (detachments) at outlying bases. Five field units were located at other Air Force bases; two field units were, for a short time, located in Paris and Tokyo. Also, liaison officers were located at three major command headquarters.⁴⁰

The new center was headquartered at Lackland AFB.⁴¹ As AFPTRC began on 1 February 1954, its key personnel were as follows:⁴²

AFPTRC Headquarters (Lackland)

Commander	Col Herbert N. Cowles
Chief of Staff	Lt Col Joel H. Yates
Technical Director	Dr. Arthur W. Melton
Deputy for Support Services	Lt Col John P. Jones
Deputy for Research and Development	Dr. Charles W. Bray

Personnel Research Laboratory (Lackland)

Director	Dr. Lloyd G. Humphreys
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Skill Components Research Laboratory (Lackland)

Acting Director	Dr. Robert M. Gagne
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Aircraft Observer Research Laboratory (Mather)

Director	Maj John V. Patterson, Jr.
Technical Director	Dr. Edward H. Kemp

Training Aids Research Laboratory (Chanute)

Director	Col Richard W. Faubion
Technical Director	Dr. Arthur A. Lumsdaine

Armament Systems Personnel Research Laboratory (Lowry)

Director	Lt Col Elmo A. Elliott
Technical Director	Dr. Robert M. Gagne

Crew Research Laboratory (Randolph)

Director	Dr. Robert L. French
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Basic Pilot Research Laboratory (Goodfellow)

Director Lt Col William V. Hagin

Interceptor Pilot Research Laboratory (Tyndall)

Director Maj Norman H. Blitch

Officer Education Research Laboratory (Maxwell)

Director Col George W. Croker
Technical Director Dr. E. L. Ballachey

By 30 November 1954, however, there had been some changes in key personnel. Within Headquarters AFPTRC, the position of Chief of Staff was changed to Vice Commander and was filled by Col John W. Quayle, and the position of Deputy for Support Services was vacant.⁴³ Other changes were as follows: Director, Skill Components Research Laboratory--Col Jack Buel; Director, Basic Pilot Research Laboratory--Lt Col Thomas F. Teery; Director, Interceptor Pilot Research Laboratory--Maj Donald W. Johnson; Director, Officer Education Research Laboratory--Col Myron F. Barlow. Also, Lt Col Hagin, formerly Director of the Basic Pilot Research Laboratory, had become the Center's Director for Operations.⁴⁴

Organizationally, AFPTRC remained basically unchanged throughout 1954. However, problems associated with the Center's geographical dispersion, plus changes in the missions of some bases where laboratories were located, portended still another reorganization.⁴⁵ In addition to these problems, the Center suffered a nearly 50 percent reduction in personnel after its formation.⁴⁶ In other words, on 31 January 1954, the three organizations which were to comprise AFPTRC had an authorized strength of 1,383 and an assigned strength of 1,278. As of 31 December 1954, AFPTRC had an authorized strength of 752, with 724 personnel assigned.⁴⁷ By 1 January 1955, one of the nine AFPTRC laboratories, the Basic Pilot Research Laboratory, had in actuality already been closed out, though authorization was not given until May 1955.⁴⁸ There was also some discussion about moving the Manpower Research Branch of the Officer Education Research Laboratory at Maxwell AFB to the Personnel Research Laboratory at Lackland AFB.⁴⁹ This action later transpired but was postponed at this time.

Changing missions at the various bases where AFPTRC laboratories were located were forcing consideration of relocations. For example, plans were already underway to move the Training Aids Research Laboratory from Chanute AFB.⁵⁰ In fact, it was at this time (July 1955) that the concept of "one roof" emerged, with a target date set for 1965.⁵¹ One major change during 1955 was reflected in the Center's mission statement issued on 14 February 1955. This statement placed a heavy emphasis on the Center's involvement in weapon systems development.⁵² This involvement was manifested by the establishment of a liaison office at the Wright Air Development Center on 1 May 1955.⁵³ This event was to have a profound bearing on future reorganizations.

During the last half of 1955 no significant organizational changes occurred, but in keeping with the "one roof" concept, the groundwork was being laid to merge the Chanute Laboratory with the Lowry Laboratory, to merge the

Maxwell Laboratory with the Personnel Research Laboratory at Lackland AFB, and to phase out the Crew Research Laboratory at Randolph AFB.⁵⁴ The key personnel listing as of the end of 1955 shows minor personnel changes within Headquarters and four new Laboratory Directors. Col Quayle was shown as Vice Commander and Chief of Staff; Dr. Bray was listed as Deputy Chief of Staff, Operations, with Lt Col Hagin as his assistant. New Directors were Col Jack Buel, Skill Components Research Laboratory; Lt Col Don H. Thwaites, Aircraft Observer Research Laboratory; Col Myron F. Barlow, Officer Education Research Laboratory; and Major Donald W. Johnson, Interceptor Pilot Research Laboratory.⁵⁵

Although 1956 began with AFPTRC consisting of eight laboratories, effective 1 May 1956, it became only three: the Personnel Laboratory at Lackland AFB, the Maintenance Laboratory at Lowry AFB, and the Operator Laboratory at Randolph AFB.⁵⁶ The laboratories had 10 field units attached. In addition, there were two separate offices of the Headquarters, the Office for Qualitative Personnel Requirements Information (OQPRI) located at Lackland AFB and the Office for Social Science Programs (OSSP) at Randolph AFB.⁵⁷ Recognition of significant increments in the AFPTRC mission appeared on this day in May 1956 with the establishment of these two offices. The QPRI Office formalized the structure for addressing the problem of specifying manpower requirements for new weapon systems; the OSSP conducted programs in intelligence methods and survival training.⁵⁸

Key personnel in the reorganized Air Force Personnel and Training Research Center as of 1 May 1956 were as follows:

AFPTRC Headquarters (Lackland)

Commander	Col Herbert N. Cowles
Deputy Commander	Col John W. Quayle
Technical Director	Dr. Arthur W. Melton
Deputy Technical Director	Dr. Charles W. Bray
Chief of Staff	Lt Col Lloyd R. Hayes
Deputy Chief of Staff/Operations	Lt Col William V. Hagin

Personnel Laboratory (Lackland)

Director	Col Myron F. Barlow
Technical Director	Dr. Lloyd G. Humphreys

Operator Laboratory (Randolph)

Director	Col Jack Buel
Acting Technical Director	Dr. Arthur W. Melton

Maintenance Laboratory (Lowry)

Director	Lt Col Robert L. Beer
Technical Director	Dr. Robert M. Gagné

Office for Qualitative Personnel Requirements Information (Lackland)

Director	Lt Col Clay D. Ellis
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Office for Social Science Programs (Randolph)

Director
Deputy Director

Dr. Raymond V. Bowers
Lt Col Clifton A. McClellan

Changes in personnel occurred during August of 1956 when Col Gilbert E. Teal became Deputy Commander,⁶⁰ and Col Morgan Goodhart became Director of the Maintenance Laboratory,⁶¹ and Col Thomas Wildes became Deputy Chief of Staff/Operations.⁶² By the end of 1956, however, the only organizational change that had occurred was the discontinuance of one of the six field units under the Operator Laboratory.⁶³ By the end of 1956, AFPTRC had attained an authorized size of 139 officers, 208 airmen, and 433 civilians; that is, 763 total.⁶⁴

The AFPTRC laboratories remained essentially intact during 1957 though some changes in the organizational structure occurred. For example, one field unit was relocated⁶⁵ and a new field unit was established.⁶⁶ It appeared on the surface that business was as usual. In June, however, the OQPRI and OSSP were discontinued, becoming divisions rather than offices,⁶⁷ and six field units were disestablished.⁶⁸ Still another field unit was discontinued in September.⁶⁹ Also, a major reorganization of Headquarters functions took place in October 1957.⁷⁰ By July 1957, rumors as to the coming disestablishment of AFPTRC became prevalent, and on 6 September 1957, Dr. Arthur W. Melton resigned.⁷¹ During the several months that followed, many scientists left the program. Senior psychologists included in this group were Dr. Lloyd G. Humphreys, Dr. Robert M. Gagne, Dr. Robert L. French, and Dr. Charles W. Bray.⁷² Turbulence in AFPTRC and accompanying personnel adjustments are reflected in Appendix C.

The climate during this period was not only one of uncertainty about the status of the organization but also of uncertainties associated with general reductions in force, funds limitations, and threatened downgrades.⁷³ A comparison of manpower figures for January 1957 and January 1958 reveals that authorizations had decreased from 763 to 384, and number assigned had decreased from 743 to 331.⁷⁴ In addition to resignations, there were numerous reassessments. By the end of 1957, only Lt Col Hayes and Col Wildes remained in their Headquarters positions.⁷⁵ Col James A. McKerley became AFPTRC Commander on 1 August 1957.⁷⁶ Dr. Bray was made Technical Director upon the departure of Dr. Melton⁷⁷ but himself resigned in December 1957 and was later replaced by Dr. Raymond D. Bowers.⁷⁸ Col Teal was reassigned, and the position of Deputy Commander was left vacant.⁷⁹

Personnel changes also occurred within the laboratories themselves. In the Maintenance Laboratory, Lt Col Robert C. Lewis became Director.⁸⁰ Dr. Gagne continued as Technical Director but resigned on 10 January 1958.⁸¹ In the Operator Laboratory, Lt Col Carl R. Carlson became Director.⁸² Dr. Robert L. French had been assigned as Technical Director of this Laboratory,⁸³ but he in turn resigned; Mr. Edwin S. Ewart was made Acting Technical Director on 23 November 1957.⁸⁴ In the Personnel Laboratory, Col Barlow remained Director. Dr. Humphreys resigned, and Dr. Abraham Carp was appointed Technical Director.⁸⁵

Preliminary guidelines from ARDC for the disestablishment of AFPTRC and distribution of its personnel, functions, and resources to the other Centers finally arrived in January 1958.⁸⁶ Col Thomas Wildes became AFPTRC

Commander⁸⁷ as the center's laboratories and field units were being phased out. The AFPTRC was formally disestablished on 15 April 1958.⁸⁸

Organization and Key Personnel, as well as a Chronology, are provided in Appendix C.

V. PERSONNEL LABORATORY/6570TH PERSONNEL RESEARCH LABORATORY

The first action in phasing out AFPTRC was the transfer of the Personnel Laboratory to the Wright Air Development Center (WADC). It became Detachment Number One of WADC effective 1 January 1958.⁸⁹ This laboratory was, in essence, all that remained somewhat intact of the vast personnel research organization that previously existed. Thus, for tracing the history of personnel research, only the history of this core unit seems relevant. The "new" Personnel Laboratory was to retain 208 authorized positions and to remain physically located at Lackland AFB.⁹⁰ Col Myron F. Barlow remained Director, and Dr. Abraham Carp continued as Technical Director.⁹¹ Branch Chiefs in the laboratory included Dr. Ernest C. Tuples, Dr. Robert M. W. Travers, Dr. Eli S. Flyer, Dr. John M. Lieman, and later, Dr. Frank B. Ford.⁹²

The history of the Personnel Laboratory during the period from 1 January 1958 through 31 December 1961 appears to have been not well documented. The Laboratory continued its human resources research alternately under the WADC and its successor designations, the Wright Air Development Division, and later, the Aeronautical Systems Division of the Air Force Systems Command (formerly ARDC). The Laboratory appears to have been little affected by these organizational changes.⁹³ It is noted only that in August 1958, Col Fred E. Holdrege, Jr. replaced Col Barlow as the Laboratory Commander. Dr. Carp continued as Technical Director.⁹⁴

On 1 February 1962, the Personnel Laboratory (now the 6570th Personnel Research Laboratory) was transferred to the newly formed Aerospace Medical Division (AMD) with its structure and staff virtually unchanged. The Laboratory must have been somewhat of an enigma to the Division, one of whose historical publications states, "...the Division did not inquire too deeply into the cabalistic ritual of this Psychean temple. It wisely left the Personnel Research Laboratory to practise its own arts in its own way."⁹⁵

The first history of AMD (1962) states only that "The Personnel Research Laboratory had 21 tasks under four contractual projects, in the areas of Human Performance and Human Factors. They dealt with personnel career planning; with selection, classification, and evaluation procedures; with techniques for the best use of personnel; and with occupational analysis."⁹⁶ The Laboratory appears too to have had only a small role within the command, for its Research and Development (R&D) budget as of 31 December 1962 represented only 7.2 percent of the R&D budget for the five AMD laboratories and other divisions and centers of AFSC.⁹⁷

In May 1963, Col Holdrege, the Personnel Research Laboratory's Commander, was reassigned to the Office of the Deputy Chief of Staff, Personnel at USAF

Headquarters. Lt Col Albert S. Knauf, head of the Specialty Knowledge Test Branch became Acting Commander.⁹⁸ In addition to Lt Col Knauf as Acting Commander, other key personnel as of 30 June 1963, were Dr. Carp, Technical Director; Dr. Eli Flyer, Adaptability and Quality Evaluation; Dr. Raymond E. Christal, Occupational Structures; Dr. Ernest C. Tupes, Selection and Classification; Dr. Frank B. Ford, Statistical Methodology and Analysis; and Dr. J. W. Bowles, Director of Operations.⁹⁹ In the third quarter of 1963, Col John V. Patterson, Jr. was assigned as Commander,¹⁰⁰ remaining until 1965 when Col James H. Ritter took the Commander position.¹⁰¹

In January 1965, Dr. Abraham Carp left the Technical Director position to become Director of Selection for the Peace Corps.¹⁰² In May 1965, Dr. Edward H. Kemp was appointed Technical Director¹⁰³ but later resigned on 18 January 1966, to accept a position in the Office of the Deputy Chief of Staff, Personnel, HQ USAF. An attempt was made at this time to convert the position to supergrade; simultaneously, preliminary attempts were made to fill it.¹⁰⁴ However, the position remained vacant throughout 1966, and key technical guidance was provided by Dr. Bowles, Director of Operations.¹⁰⁵ As of 30 June 1966, key personnel were Maj John J. Felthaus, Jr., Executive Officer; Dr. Christal, Occupational Structures Research Division; Dr. Tupes, Selection and Classification Division; Dr. Flyer, Adaptability and Quality Evaluation Division; Dr. Ford, Statistical Methodology and Analysis Division; and Lt Col Ralph S. Hoggatt, Specialty Knowledge Test Division.¹⁰⁶

A review of key personnel as of 30 June 1967, shows that Dr. Bowles was serving as Acting Technical Director (though at least one source¹⁰⁷ shows he was appointed Technical Director in January 1967), Dr. Leland D. Brokaw as Acting Director of Operations, and Maj G. F. Stauffer as acting head of the Adaptability and Quality Evaluation Division.¹⁰⁸ This latter Division's former chief, Dr. Flyer, had transferred to the Office of the Secretary of Defense.¹⁰⁹ Other key personnel remained the same. In the AMD History of 30 June 1967, the Laboratory was shown to have 229 authorized positions, with 228 assigned (21 officers, 77 airmen, and 130 civilians).¹¹⁰ Its fiscal year 1967 budget was \$1,787,000.¹¹¹

By 30 June 1968, which was the last day that the 6570th Personnel Research Laboratory remained under the Aerospace Medical Division, the organizational structure and key personnel were as follows: Col Ritter, Commander; Lt Col Frank L. McLanathan, Executive Officer; Dr. Bowles, Technical Director; Dr. Brokaw, Chief of Operations; Dr. Christal, Occupational Research Division; Dr. Tupes, Selection and Classification Division; Lt Col Walter F. Murphy, Adaptability Research Division; Dr. Robert A. Botenberg, Statistical Analysis Division; and Mr. Stephen W. Fotis, Career Evaluation Division.¹¹²

Chronology and Key Personnel appear in Appendix D.

VI. AIR FORCE HUMAN RESOURCES LABORATORY

The expanded United States involvement in Vietnam in 1965 through 1966 raised questions concerning Air Force personnel assignment in the combat zone, and as to the availability of pilots in certain categories. It developed that

these questions could be answered only through the longitudinal personnel data files at the Personnel Research Laboratory. These special studies attracted the attention of the Secretary of the Air Force, who directed the Air Force Scientific Advisory Board to review the behavioral science research program.¹¹³

In a 10 December 1966 memo to the Air Force Chief of Staff, the Secretary of the Air Force made these comments:¹¹⁴

In order to vitalize the manpower/personnel area, I have asked Dr. Ferraro, Deputy Under Secretary for Manpower, to review the research and analysis work done by the Air Force Systems Command which directly supports his function. He has looked into the current programs and has raised certain questions regarding the work done principally by the Personnel Research Laboratory and to a limited extent by other organizations within the Air Force Systems Command. These questions involve the quality and quantity of technical staffing and management relationships; and the missions, objectives and plans for the future.

To insure that we proceed with the best advice available to us, I would appreciate the Scientific Advisory Board assigning a panel, augmented as necessary, to make a complete review of this important area of our work and make appropriate recommendations to you and to me.

Resulting recommendations of the Scientific Advisory Board brought about the activation of the Air Force Human Resources Laboratory (AFHRL) on 1 July 1968.¹¹⁵ Headquartered at Brooks AFB, Texas, AFHRL subsumed the Personnel Research Laboratory and the Training Research Division of the Aerospace Medical Research Laboratory at Wright-Patterson AFB, Ohio. The Personnel Research Laboratory was redesignated as a Division of AFHRL; the Training Research Division became the Advanced Systems Division of AFHRL.¹¹⁶

Thus, in July of 1968, the Air Force Human Resources Laboratory consisted of two divisions: the Advanced Systems Division and the Personnel Research Division. In May 1969, two Divisions were added: the Flying Training Division and the Technical Training Division.¹¹⁷ The Professional Education Division was added in November 1969¹¹⁸ but was later deactivated in 1972.¹¹⁹ A sixth division, the Manpower Development Division, was added in 1971 when the Manpower Development Programs Office was made a division.¹²⁰

A major reorganization occurred in August 1973, at which time two branches of the Personnel Research Division were themselves made divisions. They were the Computational Sciences Division and the Occupational Research Division. At the same time the Manpower Development Division was renamed the Manpower and Personnel Division.¹²¹ When this latter division was deactivated in November 1974, some of its functions were assumed by the other divisions. At this time, the Occupational Research Division was renamed the Occupation and Manpower Research Division.¹²² Also, in November 1974, two divisions at Lackland were reorganized in a format to provide military chiefs and civilian technical directors.¹²³

At the end of July 1979, the end of the period covered by this publication, AFHRL consisted of a Headquarters and six Divisions. Organizational changes and changes in key personnel for the Laboratory from its formation to this date are shown in the chart which follows.¹²⁴

AIR FORCE HUMAN RESOURCES LABORATORY (AFHRL)

1 July 1968 -- 30 July 1979

Headquarters

Commander

Lt Col Herbert H. Reynolds (Acting) (June 1968 to September 1968)
Col John G. Dailey (September 1968 to October 1970)
Col George K. Patterson (October 1970 to February 1973)
Col Harold E. Fischer (February 1973 to April 1976)
Col Dan D. Fulgham (April 1976 to July 1978)
Col Ronald W. Terry (July 1978 to present)

Vice Commander

Col Oscar A. Berthold (August 1970 to October 1972)
Col Harold E. Fischer (October 1972 to February 1973)
Col Oscar A. Berthold (February 1973 to May 1975)
Col Dan D. Fulgham (July 1975 to March 1976)
Col Kenneth E. Stout (July 1976 to present)

Chief Scientist

Dr. Howard L. Parris (October 1971 to September 1975)
Dr. Earl A. Alluisi (January 1979 to present)

Plans and Programs Office (February 1977 to present)
(Was originally named the Plans Office. Became Plans and Applications Office in May 1973. Was renamed the Plans and Programs Office in February 1977.)

Chief

Lt Col C. A. Johnson (January 1969 to April 1971)
Dr. Roy A. DeGaugh (April 1971 to May 1973)
Dr. Herbert J. Clark (Acting) (May 1973 to August 1973)
Dr. Herbert J. Clark (August 1973 to present)

Assistant Chief

Dr. Roy A. DeGaugh (January 1969 to January 1970)
Dr. Herbert J. Clark (March 1970 to May 1973)

Operations Office (July 1968 to present)

Chief

Dr. Donald E. Meyer (Acting) (July 1968 to January 1969)
Lt Col Leslie J. Knapp (January 1969 to October 1969)
Lt Col Walter F. Murphy (October 1969 to May 1970)
Col Harold B. Powell (May 1970 to present)

Deputy/Assistant Chief

Dr. Roy A. DeGaugh (January 1970 to April 1971)
Dr. Jane McReynolds (May 1973 to present)

Applications Office (February 1977 to present)

Chief

Col Ralph S. Hoggatt

ADVANCED SYSTEMS DIVISION
(July 1968 to present)

Chief/Director

Dr. Gordon A. Eckstrand (July 1968 to March 1979)
Lt Col James A. Cline (March 1979 to present)

Assistant Chief/Deputy Director/Technical Director

Lt Col Melvin E. Majesty (September 1968 to November 1969)
Lt Col Edward A. Cope (August 1973 to December 1976)
Lt Col John F. Ahlborn (July 1977 to January 1979)
Lt Col John R. Adams (January 1979 to March 1979)
Dr. Gordon A. Eskstrand (March 1979 to present)

PERSONNEL RESEARCH DIVISION

Chief (July 1968 to present)

Col James H. Ritter (July 1968 to September 1968)
Lt Col Frank L. McLanathan (September 1968 to October 1969)
Col James J. Sheppard (October 1969 to June 1971)
Col Ralph S. Hoggatt (September 1971 to March 1973)
Col Oscar A. Berthold (March 1973 to August 1973)
Dr. Leland D. Brokaw (August 1973 to November 1974)
Col Theodore B. Aldrich (November 1974 to August 1975)
Col Dan D. Fulgham (Additional Duty) (August 1975 to February 1976)
Col Tyree H. Newton (February 1976 to October 1977)

Dr. Nancy Guinn (Acting) (October 1977 to January 1978)
Col Tyree H. Newton (January 1978 to September 1978)
Dr. Nancy Guinn (Acting) (September 1978 to November 1978)
Col Tyree H. Newton (November 1978 to present)

Technical Director (July 1968 to present)

Dr. J. W. Bowles (July 1968 to June 1973)
Dr. Leland D. Brokaw (November 1974 to June 1979)
Dr. Nancy Guinn (June 1979 to present)

PERSONNEL RESEARCH DIVISION
(July 1968 to August 1973)

Selection and Classification Branch (July 1968 to October 1969) (Discontinued)

Lt Col Walter F. Murphy (July 1968 to October 1969)

Career Evaluation Branch (July 1968 to July 1970. Transferred to Air Training Command)

Mr. Stephen W. Fotis (July 1968 to July 1970)

Computer and Management Sciences Branch (July 1968 to August 1973) (Became the Computational Sciences Division)

Dr. Robert A. Bottenberg (July 1968 to August 1973)

Occupation and Career Development Branch (July 1968 to August 1973) (Became first the Occupational Research Division (1973) then the Occupation and Manpower Research Division)

Dr. Raymond E. Christal (July 1968 to August 1973)

Personnel Systems Branch (July 1968 to August 1973) (This branch in effect became the Personnel Research Division in 1973; its sections became branches.)

Dr. Ernest C. Tupes (July 1968 to June 1971)

Dr. Leland D. Brokaw (June 1971 to August 1973)

Personnel Research Division (August 1973 to May 1974) (These branches were consolidated into two branches effective May 1974.)

Selection Systems Branch

Dr. Lonnie Valentine

Behavioral Systems Branch

Dr. Cecil J. Mullins

Motivation and Retention Systems Branch

Dr. Nancy Guinn

Testing and Support Branch

Mr. Cecil O. Cannon

PERSONNEL RESEARCH DIVISION
(May 1974 to present)

Selection and Classification Systems Branch (May 1974 to present)

Dr. Lonnie Valentine (May 1974 to present)

Demographic and Attitudinal Research Branch (May 1974 to present)

Dr. Nancy Quinn (May 1974 to October 1977)

Mr. Bart Vitola (Acting) (October 1977 to January 1978)

Dr. Nancy Quinn (January 1978 to June 1979)

Dr. William E. Alley (August 1979 to present)

Manpower Development and Evaluation Branch (November 1974 to present) (Was formerly a branch of the Manpower and Personnel Systems Division.)

Lt Col Forrest R. Ratliff (November 1974 to present)

FLYING TRAINING DIVISION
(May 1969 to present)

Chief

Lt Col David O. Anderson (February 1970 to September 1971)

Lt Col Dan D. Fulgham (September 1971 to June 1975)

Maj Brian K. Waters (July 1975)

Col J. D. Boren (July 1975 to June 1978)

Col Richard C. Needham (June 1978 to present)

Deputy Chief

Lt Col Richard G. Cronquist (August 1976 to present)

Technical Director/Technical Advisor

Dr. William V. Hagan (August 1969 to July 1976)

Dr. Edward E. Eddowes (September 1976 to March 1978)

Lt Col Dirk Prather (June 1978 to present)

TECHNICAL TRAINING DIVISION
(May 1969 to present)

Chief

Lt Col Donald F. Ford (July 1969 to April 1970)
Lt Col Walter F. Murphy (September 1970 to June 1973)
Lt Col Robert G. Mathias (July 1973 to February 1978)
Lt Col Brian K. Waters (March 1978 to May 1978)
Col Richard L. Shelton (May 1978 to present)

Technical Director

Dr. Marty Rockway (September 1969 to present)

PROFESSIONAL EDUCATION DIVISION
(November 1969 to June 1972) (Deactivated)

Chief

Lt Col Melvin S. Majesty (November 1969 to June 1972)

Technical Director

Dr. Sheldon MacLeod (March 1970 to June 1972)

MANPOWER AND PERSONNEL SYSTEMS DIVISION
(August 1973 to November 1974) (Deactivated)

(Was the Manpower Development Programs Office until April 1971. Became the Manpower Development Division in April 1971, and the Manpower and Personnel Systems Division in August 1973.)

Chief

Lt Col J. D. Caldwell (December 1969 to December 1970)
Lt Col Paul D. Thompson (December 1970 to March 1972)
Lt Col Forrest R. Ratliff (March 1972 to August 1973)
Col Theodore B. Aldrich (August 1973 to November 1974)

Technical Director

Dr. Aaron Nadel (April 1970 to June 1973)
Dr. Roy A. DeGaugh (August 1973 to May 1974)

OCCUPATION AND MANPOWER RESEARCH DIVISION
(November 1974 to present)

(Was formerly the Occupation and Career Development Branch of the Personnel Research Division. Became the Occupational Research Division in August 1973. Renamed the Occupation and Manpower Research Division in November 1974.)

Chief

Dr. Raymond E. Christal (July 1968 to November 1974)
Col James B. Carpenter (November 1974 to July 1975)
Lt Col Veskel E. Johnson (July 1975)
Lt Col William H. Pope (July 1975 to December 1977)
Lt Col Veskel E. Johnson (December 1977 to April 1978)
Col William C. DeBoe (May 1978 to present)

Technical Director

Lt Col James B. Carpenter (August 1973 to November 1974)
Dr. Raymond E. Christal (November 1974 to present)

COMPUTATIONAL SCIENCES DIVISION
(August 1973 to present)

(Was formerly the Computer and Management Sciences Branch of the Personnel Research Division. Became the Computational Sciences Division in August 1973.)

Chief

Dr. Robert A. Bottenberg (July 1968 to present)

As one can see from the listing of key personnel for the period, AFHRL has had five commanders and two chief scientists. Changes within the Headquarters Staff Offices have been relatively few. There have been only three plans chiefs and three operations chiefs during this time. The Applications Office was established in February 1977.

Within the Personnel Research Division (the former Personnel Research Laboratory), several major changes occurred. When established in July 1968, the Division consisted of five branches.¹²⁵ One was discontinued in 1969.¹²⁶ In an effort to purify the research mission of the Division, the Career Evaluation Branch was transferred to the Air Training Command in 1970.¹²⁷ During the reorganization of AFHRL which occurred in August 1973, the remaining three branches became divisions. The Personnel Systems Branch in effect became the Personnel Research Division. The branch's four sections were made branches of the new division.¹²⁸ This was done to make all AFHRL research entities approximately the same size and to provide the personnel at Lackland with Headquarters representation more nearly equivalent to that of the other divisions.¹²⁹

In May 1974, the four branches were consolidated into two: the Selection and Classification Systems Branch and the Demographic and Attitudinal Research Branch.¹³⁰ A third branch, the Manpower Development and Evaluation Branch, was moved from the defunct Manpower and Personnel Systems Division in November 1974.¹³¹ Thus, the Personnel Research Division, what was left of it, continued with three branches for the remainder of this period.

VII. PRINCIPAL RESEARCH THEMES

1946 to 1949

Calendar year 1946 was devoted to the completion of volumes papering the World War II Aviation Psychology Program. Dr. Frederick B. Davis, in the Office of the Air Surgeon played a major role in coordinating the manuscripts through the Government Printing Office. The Psychological Research Project (Pilot) and Aviation Psychological Research Unit Number 1 completed volumes on Psychological Research in Pilot Training (Vol 8)¹³² and Psychological Research on Flight Engineer Training (Vol 13).¹³³

During this period, assistance was given to selection of instructional staff members for the Reserve Officer Training Corps (ROTC) detachments to support the Air Force when it became an independent element of the Department of Defense. Specialized services were rendered in validation and development of paper-and-pencil examinations for assessment of knowledges basic to the rating of pilot, and to the granting of instrument cards to pilots. Another ad hoc effort was the development of a specialized practical application course to be used for the assessment of trainees in the Officer Candidate School. Although these piecemeal efforts lacked a central theme, a major milestone was passed in early 1947 when the requirement was levied for the development of a test-based classification system for all Air Force enlisted personnel.¹³⁴ Experimental batteries administered in 1947 and subject to preliminary validation in 1948 resulted in a Technical Training Classification Battery that became operational 9 December 1948.¹³⁵ The career guidance and counseling system to support the classification battery became operational on 3 January 1949.¹³⁶ The development and continued improvement of the enlisted selection/classification system became a continuing theme of the Air Force behavioral science research and development program.

During this period the Aircrew Classification Battery developed in World War II continued as the primary selection device for pilot and navigator trainees.¹³⁷ An early plan for centralized selection and classification testing was abandoned in favor of traveling teams of aircrew examiners. These teams traveled in staff cars and semi-trailer vans with installed paper-and-pencil and psychomotor testing facilities. These teams visited ROTC detachments to qualify candidates for pilot and navigator training. In the fall of 1953, the costs of operation, the difficulties in maintaining the calibration on the psychomotor equipment, and the small contribution to validity from the apparatus brought about the decision to abandon apparatus-based tests. Pressure from HQ USAF for less testing time resulted in the preparation of a shortened test battery, initially entitled "The Aviation Cadet-Officer Candidate Qualification Test (AC-OC-QT)," which took

about 5 hours to administer, as opposed to the nearly 7 hours of tests in the paper-and-pencil version of the Aircrew Classification Battery. Later versions of this instrument are known as the Air Force Officer Qualifying Test (AFOQT).

In summary, the 1946 to 1949 period saw many small ad hoc studies, and the initiation of the enlisted classification program, a core element of the Air Force program until the present day.

1949 to 1958

The first half of this period saw a steadily increasing capability in the Air Force behavioral science program; the second half saw a dramatic expansion in personnel and mission responsibility. In retrospect, it is probable that the program grew too rapidly, and without proper interfaces with the operating Air Force for transfer of technology to the user. At any rate, in the first quarter of calendar year 1958, the Air Force drastically reduced the scope of the program, leaving only the basic structure for determining the content of Air Force jobs, selecting and classifying personnel for Air Force occupations, and developing specialty knowledge tests for use in skill upgrading, basic to enlisted promotion.

1949 to 1954

In order to show the scope of the organization and effort in the early 1950s the following material is papered verbatim from an historical paper entitled "Human Resources Research and Development Program for FY 1950." The author is not identified.

SIGNIFICANT HIGHLIGHTS OF RESEARCH

A detailed account of the research program of the Center is given below. This section is devoted to describing the significant aspects of the research work of the various directorates and the laboratory of the HRRC in relation to their respective research missions.

DIRECTORATE OF PERSONNEL RESEARCH

In carrying out the research mission of improving selection and classification instruments, this Directorate made a number of significant advances during the year:

1. Work was continued on identifying basic behavior characteristics which can be measured by instruments adapted for group or mass testing use. The more such factors can be identified and measured, the more precise will be selection and classification of personnel in terms of their psychological requirements for training and eventual assignment to Air Force jobs.

2. Considerable success was demonstrated in the use of biographical inventories, by which background information is obtained for use in predicting success in training for various types of airman assignments. Such types of evaluation effectively supplement the measurement of intellectual traits for use in classification procedures, inasmuch as they furnish an evaluation of a man's interest and motivation for the type of work to which he is to be assigned. The ultimate results of making such measurements will be increased efficiency and effectiveness of airmen in the performance of their duties, with the consequent reduction in reassignment because of failure to demonstrate the proper attitude in the performance of a job. Increasing the predictive value of classification procedures in this regard will result in a considerable savings to the Air Force because of increased stability in assignment of airmen.

3. Shortening of the separate tests employed in the present Airman Classification Battery was demonstrated to be feasible without appreciable loss of validity for predicting future success of airmen in the various technical school assignments made on the basis of such testing. This means that in the event of a general mobilization the gains made through multiple classification testing can be retained in a large measure if classification testing must be expedited under emergency conditions. However, it is considered desirable to retain the longer battery if at all possible because in terms of the large number of personnel likely to be processed, the additional validity gained through use of the longer battery will mean appreciable savings to the Air Force through more adequate placement of a higher percentage of personnel than can be achieved through the use of a shortened form of the battery.

4. During World War II, most eliminations from basic pilot training occurred for one reason; namely, lack of ability to learn to fly, or flying deficiency. At the present time, however, the eliminations in basic pilot training due to flying deficiency constitute little more than half of all eliminations; whereas, eliminations for such reasons as resignations, physical deficiency, and administrative reasons account for the balance. In order to ascertain whether instruments could be employed in the Aircrrew Classification Battery which would predict voluntary withdrawals from flying training, certain measuring instruments for that purpose were studied. It was discovered that it was possible to predict eliminations from flying training for reasons which indicated motivational deficiency (lack of real desire

to learn to fly military aircraft). The addition of such measures to a selection program would reduce significantly the present high elimination rate for reasons other than flying deficiency.

5. A revised Airman Classification Battery was placed in operational use as of 6 December 1949. This revision included changes in weights for combining the separate tests employed to obtain the various aptitude indices. A new aptitude index for electronics technician was added and the instructor aptitude index was dropped. The primary effect of the new battery has been to increase the efficiency in utilizing the manpower available to the Air Force, because the validity of each separate aptitude index has been maximized to increase the discrimination value of each of the eight aptitude indices which are obtained [Mechanical, Clerical, Equipment Operator, Radar Operator, Technician Specialty, Services, Craftsman, and Electronics Technician]. As a consequence, the number of airmen making high scores on several different aptitude indices has been reduced and thus the battery differentiates among the airmen more distinctly to enable classification personnel to select more precisely those definitely qualified for assignment in career fields according to the aptitudes required.

6. Research was initiated for obtaining measures of non-intellectual qualitative aspects of behavior, which have long been recognized as important factors for success in the performance of various jobs. There have been no measures of such factors which were adequate or appropriate for employment in group testing such as must be accomplished in selection, classification, and proficiency evaluation programs in the military service. From preliminary results obtained, it is anticipated that within the foreseeable future there will be available types of measurement for several traits which can be included in selection and classification batteries to increase their predictive validity. Such measures will be especially useful in selection programs for officers where qualitative aspects of behavior are known to be heavy contributors to successful leadership.

PERCEPTUAL AND MOTOR SKILLS
RESEARCH LABORATORY

A considerable number of Air Force jobs require a high degree of aptitude for training in perceptual and motor skills. Research in this area requires highly

specialized laboratory equipment and especially qualified research personnel.

1. The Perceptual and Motor Skills Research Laboratory was established at the beginning of FY 1950 and has been furnished during the year both equipment and personnel to enable it to undertake a number of projects in the analysis and training of perceptual and motor skills. The advantage of having an especially designed and staffed laboratory for the purpose of such research is the fact that the perceptual and motor skills components as they occur in many Air Force jobs can be isolated and specifically studied. The research results thus obtained will have immediate applicability for improving the selection and training procedures wherever the components analyzed are essential for the successful performance of various tasks in Air Force jobs.

2. Some of the projects initiated by the Laboratory during FY 1950 are to conduct basic research which will lead to principles which will be applicable to the development of new psychomotor tests. Some of the tests which will result will be of the paper-and-pencil variety for inclusion in various group-administered selection and classification batteries.

3. Other projects will furnish essential principles for the evaluation of synthetic training devices which are designed to train personnel rapidly in the special performance of selected perceptual and motor skills as they occur in various Air Force jobs.

4. Other projects are concerned with the problem of reestablishing skills after periods of disuse. Of special interest will be the results of such studies in relation to the problem of recalling to active duty reserve personnel for Air Force jobs which require a high degree of perceptual and motor skill when such personnel have not had continuing practice in such skills. Research results from the appropriate studies to be undertaken by the Laboratory will furnish information as a basis for determining how much retraining such reservists will require in order to become once again highly proficient in the performance of their duties.

DIRECTORATE OF TECHNICAL TRAINING
RESEARCH

Since training research was notably deficient during World War II in contrast to research on personnel selection and classification, and since the lack of research results in this area was sorely felt in organizing efficient and effective rapid training programs during the war, it was decided in the overall planning of the Center that the major effort of FY 1950 should be devoted to the organization and development of the Directorate of Technical Training Research. Recruitment of qualified research personnel to staff the Directorate was pressed vigorously with considerable success, and a number of research projects of major importance to the Air Force were initiated.

1. The lack of adequate criteria on which to base evaluations of selection and classification procedures, training methods, and proficiency measures has been a source of difficulty in determining the extent of applicability of research findings. Consequently, a large amount of initial effort of this Directorate is being concentrated upon the problem of obtaining realistic criteria of job performance for various critical Air Force jobs, including non-commissioned officer leadership. The obtaining of adequate criteria presents many problems, many of which involve Air Force administrative procedures. Considerable liaison and coordination has been involved in obtaining the assistance of operational personnel in modifying and stabilizing operating conditions in order to enable research personnel of this Directorate to obtain appropriate criterion data. With the excellent cooperation received, it has been possible to establish several experimental situations which will result in data of considerable significance against which various types of measurement of airmen aptitudes, proficiency, and morale can be assessed, as well as evaluating the effectiveness of comparative methods of training for particular Air Force specialties.

2. A continuing problem in any large scale organization, whose mission can be accomplished only through the effective working together of a large number of highly specialized personnel, is that of maintaining a high level of morale among the individuals who constitute the group. Several research projects have been initiated which are designed to reveal essential information concerning the factors which maintain an individual's morale at a high level and, as a consequence, increase group effectiveness.

3. Research projects have been undertaken to ascertain the relative merits of various methods of job-worker analysis in terms of the different purposes for which such analyses are used. The immediate purpose of such research is to develop methods of measuring the basic dimensions and psychological characteristics of Air Force jobs. It is expected that the identification of these basic characteristics and the psychological requirements of tasks will provide information that will be valuable in improving personnel management practices, especially in reference to the airman career development program, proficiency analysis, streamlining of training curricula and methods, and, in fact, all aspects of the personnel program of the Air Force. One project of immediate importance to the Air Force concerns itself with identifying the skills, knowledges, and abilities which will be required of maintenance personnel for the maintenance of new radar bombing equipment before such equipment is assigned to a using agency. At the present time, newly developed equipment is received by using agencies and often requires maintenance before training procedures for such maintenance have been established. Considerable delay in the most efficient utilization of such equipment is caused by the use of inadequately trained maintenance personnel. Results of this study are expected to set the pattern for establishing the methodology for the selection, training, and assignment of maintenance personnel for all types of vital new equipment so as to eliminate the delays which currently exist.

4. The importance of obtaining adequate criteria against which to evaluate comparatively different training methods is important, as indicated above, and much needed direct research on problems in the area of training methods must await some of the results to be obtained from criterion research. However, it is possible to initiate some studies in the area of training methods with profit and it is planned to step up the emphasis in this area in the immediate future. One project of general interest concerns the learning and retention of the fundamentals of electricity and electronics as given in the basic radar course. It is intended to identify the elements in the basic radar curriculum which are being taught effectively, and therefore, lay the basis for future experimental analysis of the interrelationships among teaching methods, classroom learning, and success on the job, and the specific relationship of curricular elements to job requirements. It is considered important to initiate and expedite research along this line, because, as in World War II, mobilization will require

speeded training programs for shredded-out Air Force jobs.

5. The lack of adequate and feasible methods for evaluating on-the-job performance has been a major difficulty. In this area the application of knowledge in the field of psychology of individual differences is very important. Operating personnel must be provided with readily usable techniques for identifying the best and the poorest man and for ascertaining the gradations in between. Accurate evaluation, especially when it requires methods other than paper-and-pencil tests, should contribute much toward improving the overall effectiveness of the Air Force insofar as proper assignment, selective promotion, reassignment, transfer, and other aspects of the personnel management program are concerned. A number of research contracts for the study of proficiency measures suitable for use in the radar mechanics specialty field have been let. Research projects in this area of necessity must be undertaken on a relatively long-term basis because adequate and applicable research results are dependent upon development of real criteria of job proficiency, construction of various and numerous types of tests, scales, proficiency checklists, job samples and other types of proficiency measurements, all of which must be studied more or less simultaneously on a comparative basis in order to arrive at the desired knowledge.

DIRECTORATE OF PILOT
TRAINING RESEARCH

One project was initiated in this Directorate by research contract. The purpose of this project is to determine experimentally methods for using a contact flight trainer which will provide the greatest amount of transfer of training to aircraft. The results of this study will provide the basis for determining the general nature of characteristics which should or should not be simulated in a ground trainer and for further studies of the actual use of a ground trainer in flying training programs. It is considered that the optimal use of ground trainers will result in considerable saving to the Air Force, inasmuch as such training is relatively less expensive than using training aircraft, provided that learning of certain required tasks is accomplished as effectively in ground trainers as in aerial flight.

DIRECTORATE OF BOMBARDMENT
OBSERVER-NAVIGATOR
TRAINING RESEARCH

The position of the Bombardment Observer-Navigator in the aerial crew is considered to be a critical one, especially since the officer who fills this position is responsible for placing bombs on an assigned target with the highest degree of accuracy which it is possible to obtain. With the increase in range bombardment aircraft, and the increase in cost and importance of the type of bomb employed, it is considered absolutely essential that the bombardment observer-navigator be trained to the highest possible degree of proficiency in the performance of his tasks and duties. Realizing the importance to the Air Force of the training for this specialty, research in this area has been accelerated during FY 1950. The main research projects which have been initiated concern the following:

1. A job analysis of the position is being undertaken. Since the bombardment observer-navigator position is a complicated one in the sense that there are several tasks and duties involved which require highly specialized training, such as navigation, radar operation, scope interpretation and visual bombing, it is essential that all of the psychological requirements of the job be identified and it be determined to what extent an individual must possess the aptitudes, ability, knowledge, skills, interests and motivation to meet these requirements.
2. Development of proficiency measures to assess the performance of bombardment observer-navigators has been undertaken to include the development of objective examinations and phase checks to be employed during aerial flight.
3. One project on the proper utilization of the ground trainer for visual bombardment has been initiated and is being undertaken by a research contractor.
4. The very special research problem on training students in radar scope interpretation and target identification is underway. Initial efforts have been directed toward developing an aiming point identification test.

THE SIGNIFICANCE OF FY 1950

It is considered that during FY 1950 a firm and stable foundation has been laid for the future growth of the Air Training Command Human Resources Research Center. Key positions were established and properly qualified personnel were appointed to them. Research planning was accomplished in areas where research projects could be established in the immediate future. In this, the Center had the assistance of highly qualified expert advice by individuals of recognized standing for research in the areas considered. Insofar as the immediately available facilities of the Center permitted, research projects were established to meet Air Force requirements for human resources research within the areas of research responsibility delegated to the Center. Research results obtained during the year made available eminently practical knowledge for improving operational personnel practices in the Air Force. Consultation services rendered assisted operating personnel in modifying procedures in line with the best available knowledge from previous research, both from within and without the military service.

The importance of expediting the attainment of maximum level of effort in the Air Training Command Human Resources Research and Development Program became more evident as the number of demands to meet requirements for research assistance in solving operating personnel problems increased and exceeded the capacity of the Center to meet with its currently available research personnel and facilities. It is evident from the type and variety of requests for personnel research received that operating personnel are becoming increasingly aware of the value of, and the need for, research in solving personnel problems. Research personnel in the Center on their part have become acutely conscious of the importance of and the need for the best possible research designs to produce results which will have significant and broad application in solving Air Force personnel problems.

Among its research personnel, it is generally felt that the research opportunity which is afforded through the Center is unparalleled. The advantages for accomplishing research of significance include staff responsibility for determining what specific research projects will best accomplish the research mission of the Center and meet the need of enabling the Air Force to utilize men more effectively as a component of weapons systems, the opportunity to obtain the necessary subjects through excellent

cooperation of operating agencies in order to obtain research data under actual military situations, which is an essential control in the design of studies intended to produce results immediately applicable in the Air Force, and an integrated program of personnel research encompassing the interrelated problems of selection, classification, training, and assignment of personnel to duty, which permits the development of realistic and adequate criteria for following up and evaluating the validity of research results.

1954 to 1958

As indicated earlier, the Air Force Personnel and Training Research Center (AFPTRC) was established in 1954. The AFPTRC represented a logical extension of the growth that had characterized the Human Resources Research Center as it transitioned from Air Training Command to the Air Research and Development Command. The incorporation of the Human Resources Research Institute, from Maxwell AFB, and the Air Force Human Factors Operations Research Laboratories, from Bolling AFB, increased the Center's responsibilities in the areas of officer educational research and the pursuit of studies of intelligence methods. A concise summary of the program can be derived from the AFPTRC mission statement and the mission statement of several subordinate laboratories. Mission statements are quoted from the History of the Air Force Personnel and Training Research Center: 1 January -- 30 June 1955, prepared by Howard D. Kramer, Center Historian.¹³⁸

THE AFPTRC MISSION

a. To accomplish research, development, and field tests on devices, methods, procedures, and policies for the selection, classification, assignment, formal and on-the-job training and education, in-training and on-the-job proficiency evaluation, and assessment and control of morale factors of individuals, teams, and organizations for the improvement of the operation and maintenance of weapon systems, equipment, and support activities of the Air Force.

b. To translate available research products and information from other sources into form suitable for use as estimates of the qualitative personnel requirements of new weapon systems.

c. To conduct social science research in support of intelligence methodology.

d. To support other ARDC centers as directed.

THE INTERCEPTOR PILOT RESEARCH
LABORATORY MISSION

1. Conduct research, development, and field test studies on:
 - a. Techniques, measures, and devices for defining and evaluating the in-training and on-the-job proficiency of interceptor pilots, and for establishing proficiency standards;
 - b. Training and instructional methods, and the design and utilization of simulators and other training devices for interceptor pilots; and
 - c. Techniques, devices, and methods for effective coordination of pilot control with ground control during interception.
2. Provide technical advice to operating commands, as required, pertaining to the selection, training, and evaluation of interceptor pilots.

THE ARMAMENT SYSTEMS PERSONNEL
RESEARCH LABORATORY MISSION

1. Conduct research, development, and field test studies on:
 - a. Techniques, measures, and devices for defining and evaluating the in-training and on-the-job proficiency of flexible gunners and maintenance personnel for existing and proposed armament and pilotless-aircraft systems, including the diagnosis of needs for on-the-job training and for establishing proficiency standards;
 - b. Methods and devices for formal and on-the-job training of operator personnel for existing and proposed flexible gunnery and pilotless-aircraft systems, and of maintenance personnel for existing and proposed armament and pilotless-aircraft systems; and
 - c. Devices for use as on-the-job performance aids in calibrating and diagnosing malfunction in complex electronic equipment.
2. Provide technical advice to operating commands, as required, pertaining to the selection, training, and evaluation of:
 - a. Maintenance personnel for complex electronic equipment in general, and armament and pilotless-aircraft systems in particular; and

b. Operator personnel for pilotless-aircraft systems and flexible gunnery systems.

THE CREW RESEARCH LABORATORY
MISSION

1. Conduct research, development, and field test studies for improving effectiveness of Air Force crews and organizational units, through devising proficiency standards, procedures for selection and assembly of group members, training procedures, and administrative controls, including:

a. Analysis and measurement of crew performance in existing and proposed types of Air Force offensive and defensive systems;

b. Analysis and measurement of attitudes, personal relationships, unit structures, and individual skills and personal characteristics important for selecting key group members and assembly of men into groups;

c. Development of improved procedures, devices, and programs for training crews, teams, and units; and

d. Identification and measurement of social factors and organizational policies, on and off the job, which affect Air Force unit performance.

2. Provide technical advice to operating commands on personnel and training matters, as required, pertaining to improvement of the effectiveness of crews and other Air Force organizational units.

THE OFFICER EDUCATION RESEARCH
LABORATORY MISSION

1. Conduct research, development, and field test studies on:

a. Devices, methods, procedures, and policies in the education and advanced selection, classification, and assignment of Air Force officers for staff and command positions;

b. Analysis of the composition and utilization of the Air Force officer population and the immediate manpower tools from which this population is drawn; and

c. Identification and measurement of critical components of senior staff and command positions.

2. Provide technical advice, as required, regarding the development and implementation of programs for the education and advanced selection, classification, and assignment of Air Force officers.

THE SKILL COMPONENTS RESEARCH
LABORATORY MISSION

1. Conduct laboratory research and development programs on:

- a. Techniques for evaluating individual proficiency in the perceptual-motor skill components of Air Force jobs;

- b. Principles of transfer of training applicable to the design of training devices and curricula for special perceptual-motor skill components of Air Force jobs;

- c. Principles relating to the interaction of perceptual-motor skill task characteristics and training variables as required for identifying and applicability of training procedures in specific Air Force tasks; and

- d. Devices, methods, and procedures for efficient initial and refresher training in perceptual-motor skill components of Air Force jobs.

2. Conduct research and development of programs and field test studies on devices and procedures for identification and measurement of psychomotor abilities for use in selection, classification, and assignment of Air Force personnel where perceptual-motor job components are critical factors.

Between 1955 and 1957 the primary mission areas of AFPTRC were stable, although there were almost continual organizational change and minor changes in noncentral mission responsibilities. Emphasis had shifted toward the development and maintenance of weapon systems to such an extent that the mission statement adopted in July 1956 read as follows:¹³⁹

1. To improve the operation and maintenance of weapon systems, equipment, and support activities of the Air Force through research, development, and testing of methods and devices for the selection, classification, assignment, training, proficiency evaluation, job performance improvement, and assessment and control of morale factors, of individuals, teams, and organizations.

2. To develop estimates of the qualitative personnel requirements of new weapon systems.
3. To conduct social science research as required and directed.
4. To provide technical advice on personnel and training matters of the Air Force as required and directed.

Continuing organizational turbulence through 1957 culminated in an Air Staff decision to abolish basic research in the personnel and training area and to reduce significantly all personnel and training research. This decision resulted in the decision to abolish AFPTRC. According to Brennan and Ritchhart (1972),

Organizationally, all that remained of AFPTRC was the Personnel Research Laboratory. Some of the manpower spaces were transferred to the Aerospace Medical Research Laboratories (AMRL) at Wright-Patterson AFB, Ohio, which was given added responsibility for forecasting personnel requirements for new systems and for conducting minimum essential training research.

Whatever else may be said about it, the abolition of AFPTRC was both a dramatic and traumatic event in the history of training research in the Air Force. It created resentment and hostility in the scientific community which supports human resources research. Scars of these attitudes still remain.¹⁴⁰

1958 to 1968

The Personnel Research Laboratory, rising from the dust of the demolition of AFPTRC, included the mission and personnel spaces previously assigned to the 2200th Test Squadron, Mitchell AFB, New York. This mission was the development and revision of the paper-and-pencil tests used for skill upgrading in each Air Force specialty. The Laboratory also included the elements previously assigned to the AFPTRC Personnel Research Directorate, with the missions of maintaining the operational airman and officer selection/classification measures, monitoring officer performance, assessing adaptability and motivation, and doing ad hoc studies for higher headquarters based upon growing longitudinal personnel data files.

Originally the Personnel Research Laboratory was an element of WADC, remaining as a subordinate unit when WADC became the Aeronautical Systems Division. Consideration of the matters of geographic separation and dissonant mission responsibilities resulted in the Laboratory's transfer to the Aerospace Medical Division (AMD), and its redesignation as the 6570th Personnel Research Laboratory.

The Aerospace Medical Division treated the Personnel Research Laboratory with benign neglect until 1967, providing a constant but moderate flow of funds for research contracting and a stable manpower base, but taking very little interest in the Laboratory program. This period of relative calm provided opportunity for the development of an effective system for the collection and analysis of data descriptive of the task content of Air Force occupations. This system was based on Comprehensive Occupational Data Analysis Programs (CODAP) which has been operationally implemented by all elements of DoD, the military services of many allied nations, Federal, state and local government organizations, and several American industrial organizations.

During the 10 years of this period, evolutionary changes in enlisted selection devices included the shortening of the 6-hour Airman Classification Battery (AC-2A) to a 1-hour, 50-minute test entitled the Airman Qualifying Examination, suitable for administration by recruiters in the field, to permit the enlistment of personnel for specified career fields, and to insure that unqualified candidates were not forwarded to the Armed Forces Examining and Entrance Stations.

Aircrew and officer selection and classification instruments were validated against pilot training success, navigator training success, Air Force Academy performance, and a variety of officer technical training courses. It should be noted that Air Force Academy entrance has never depended upon the Air Force Officer Qualifying Test, but has depended upon the same examinations used for screening for most universities, within a context of nominations by Congressmen and Governmental leaders, and academic and performance screening by a faculty board.

Concern about the reliability of officer promotion boards led to a series of studies of the content and applications of the Officer Effectiveness Report and attempts to replicate the actions of such boards through computer analyses of the contents of personnel records. These studies demonstrated the actions of promotion boards to be at useful levels of reliability, and that the computer could replicate board actions very closely. Although the Promotion Secretariat of the Air Force Manpower and Personnel Center has chosen not to substitute computer-based promotion for their promotion boards, they do use the computer to identify officers which the board has not treated in accordance with the computer prediction, and they refer such cases to other boards for additional review.

As computer power grew, and as longitudinal personnel data files accumulated, attention was given to the development of more powerful analytic techniques than were feasible with desk calculators. Efforts were channelled into models devoted to the optimal assignment of manpower to jobs, and tracing the flow of personnel through the personnel system.

During these 10 years, the behavioral science program in the Air Force developed a stable foundation and provided methodologies and information sources to personnel planners which led to demands for more capability, and a broader program, again encompassing significant elements on the training side, as well as in manpower and personnel research.

1968 to 1979

In 1967 the Secretary of the Air Force convened a special panel of the Air Force Scientific Advisory Board (SAB) to review the behavioral science program. The SAB recommended that more than twice as many manpower positions as existed in the Personnel Research Laboratory should be employed in manpower, personnel, and training research, with significantly incremented funding for R&D contracting. The board recommended a new organization, with field elements collocated with using agencies.

The Air Force Human Resources Laboratory was activated on 1 July 1968, incorporating the Personnel Research Laboratory from AMD and the Training Research Division of the Aerospace Medical Research Laboratory (AMRL). As personnel and facilities could be made available, additional units were activated at operating locations on Lowry AFB and Williams AFB, at the Air Force Academy, and at the Air University.

In the original concept, AFHRL was to have significant programs in pilot training research at Williams AFB, technical training research at Lowry AFB, and officer educational research at the Air Force Academy and the Air University. The Training Research Division of AMRL was redesignated as the Advanced Systems Division of AFHRL, and its mission lies in the development of training devices and advanced concepts for the use of simulators in training.

Some of these original plans worked out very well; others failed. For example, the Professional Education Division was unsuccessful in identifying a mission, and was disestablished in 1972. In April 1971, a new division, entitled the Manpower Development Division was established in Alexandria, Virginia, to provide support to the Assistant Secretary of Defense (Manpower and Reserve Affairs.) This organization functioned for 2 1/2 years in the Washington area, providing support in statistical analyses and in the development of surveys dealing with attitudes, morale, motivation, and utilization of military personnel across the Army, Navy, and Air Force. As it became apparent that this was more of a professional service organization than a research organization, its functions were subsumed by divisions at Lackland AFB in 1973 and shifted to the Laboratory R&D orientation. Its mission lies in the mathematical modeling of Air Force personnel systems and in the assessment and development of performance evaluation devices for officers and airmen.

The Advanced Systems Division and the Flying Training Division accomplished a joint effort in the development and installation of a state-of-the-art simulator for pilot training, the Advanced Simulator for Pilot Training (ASPT). Research experience with this device has shown that great potential economy lies in the use of simulators for continuation and transition training, as well as in undergraduate pilot training.

The Technical Training Division at Lowry AFB has developed an effective computer-based adaptive instructional system in three Air Training Command courses. This Advanced Instructional System (AIS) is providing insights into the characteristics of optimal training systems.

The manpower and personnel research program forwarded by the Occupational Research Division, the Personnel Research Division, the Manpower Development Division, and the Computational Sciences Division continued into the 1978 time

period along the channels instituted in the early 1960s. The increasingly precise description of Air Force jobs, the specification of aptitudinal, training, educational, and experience prerequisites for those jobs, the identification of the individual characteristics associated with successful training for and performing of those jobs, and methods for evaluating the performance of the jobs have continued in both basic research and exploratory development projects. Reorganization in November 1974 combined the modeling mission of the Manpower and Personnel Systems Division (Manpower Development Division) with the occupational analysis mission of the Occupational Research Division, and the resulting organization was designated as the Occupation and Manpower Research Division. The performance evaluation segment of the mission of the Manpower and Personnel Systems Division was transferred to the Personnel Research Division. Emphasis shifted from attempting to evaluate total job performance to a basic research enterprise devoted to the development of job performance criteria for use in validation of selection and classification tests.

Efforts to develop more effective predictors of maladaptive behavior associated with untimely attrition have been marginally satisfactory, but an effort dedicated to the development of an Air Force-specific vocational interest inventory has provided highly encouraging results; one year after administration in basic training, the Vocational Interest-Career Examination (VGICE) has shown solid prediction of job satisfaction for both men and women. Studies are in process to determine if VOICE scores are related to attrition during the first term.

During the period covered by this paper, more than 1,600 technical reports have been published in the in-house series. Many papers have appeared in professional journals. These reports have covered efforts of all HRRC, AFPTRC, PRL, and AFHRL research units, going well beyond the manpower and personnel program reviewed briefly in this paper. Appendix E provides a bibliography of landmark reports in the manpower and personnel area.

APPENDIX A: EARLY PSYCHOLOGICAL RESEARCH ORGANIZATIONS

Chronology and Key Personnel
(1946 to 1949)

EARLY 1946

Medical and Psychological Examining Unit (MPEU) (Keesler Field, Mississippi)

Director Capt Reuben A. Baer

Assistants Mr. Fredrick H. Ruhles and Mr. Howard Madden

Psychological Research Project (Pilot) (Randolph Field, Texas)

Director Capt John T. Dailey

Technical Director Dr. John T. Cowles

Staff: Dr. Robert J. Keller, Mr. Robert Unger, Mr. Leland C. Brokaw, Miss Iris Hart, Capt William V. Hagin

1 MAY 1946 -- MPEU disestablished to form:

Psychological Research and Examining Unit (PREU) (Lackland AFB)

Director Capt Reuben A. Baer

OCTOBER 1946 -- Psychological Research Project (Pilot) redesignated:

Aviation Psychological Research Unit No. 1 (ARPU Nr 1)

Director Dr. John T. Cowles

Deputy Mr. John T. Dailey

13 JANUARY 1947 -- ARPU Nr 1 merged with PREU.

Psychological Research and Examining Unit (PREU)

Director Capt Reuben A. Baer

Director of Research Dr. John T. Cowles (January 1947 to July 1948)

Dr. John T. Dailey (July 1948 to August 1948)

AUGUST 1948 -- PREU redesignated:

3309th Research and Development Group

LATER IN 1948 -- Again redesignated:

3309th Research and Development Squadron

1 JULY 1949 -- HRRC established.

APPENDIX B: HUMAN RESOURCES RESEARCH CENTER

PART I: ROSTER OF RESEARCH AND ADMINISTRATIVE PERSONNEL
30 JUNE 1950

1. HEADQUARTERS -- LACKLAND AIR FORCE BASE -- SAN ANTONIO, TEXAS

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Col John T. Fitzwater
Col Clark L. Hosmer

Commanding Officer

Deputy Commanding Officer

Deputy for Research

Dr. Arthur W. Melton
Dr. Wilton P. Chase
Lt Col Stebbins W. Griffith
Maj Lawson Clary, Jr.

Deputy for Research

Technical Review Branch
Executive Officer
Program Monitor

Research Advisory Board

Dr. Lyle H. Lanier
Dr. James J. Gibson
Dr. Phillip J. Rulon
Dr. S. Rains Wallace
Dr. J. W. McConnell
Dr. Robert L. Thorndike
Dr. Lloyd G. Humphreys
Dr. Fillmore H. Sanford
Dr. Francis G. Cornell

New York University
Cornell University
Harvard University
Life Insurance Agency Mgt Assoc.
Cornell University
Columbia University
Stanford University
Haverford College
University of Illinois

2. DIRECTORATE OF PERSONNEL RESEARCH -- LACKLAND AIR FORCE BASE -- SAN ANTONIO, TEXAS

Office of Research Director

Dr. John T. Dailey
Capt Glenn E. McClure
Mr. William B. Lecznar
2d Lt Edward V. Hoersch

Testing and Processing Division

Capt Vernon Henderson
1st Lt Marvin E. Grunzke
2d Lt R. G. Latham

Records and Analysis Division

1st Lt I. A. Nichols
Iris H. Massey

Technical Services Division

2d Lt J. M. Dowling

Aptitude Measurement Division

Dr. Donald B. Gragg
Dr. Helen Thomlinson
Dr. Mary Agnes Gordon
Leland D. Brokaw
Dr. Virginia Zachert
Evan W. Pickrel
R. W. Birkman

Norman D. Bryant
Joseph D. Austin
Raymond E. Christal
John A. Cox, Jr.
N. L. Dubberly
M. P. Naas
J. A. Tucker, Jr.

Motivation and Personality Measurement Division

Dr. Ernest C. Tupes
Dr. Abraham S. Levine
Donald V. Torr
1st Lt A. R. Stafford

3. PERCEPTUAL AND MOTOR SKILLS RESEARCH LABORATORY -- LACKLAND AIR FORCE BASE
SAN ANTONIO, TEXAS

Research Director

Dr. Robert M. Gagne
1st Lt F. W. Beekman, Jr.

Motor Skills Research Division

Dr. John B. Reynolds
Dr. I. M. Bilodeau

E. T. Klemmer
Howard L. Madden

Training Devices Research Division

Dr. Edward A. Bilodeau

Perceptual Skills Research Division

J. M. Vanderplas

Data Analysis Unit

M. W. Summers
M. H. Smith, Jr.
1st Lt Clyde E. Noble

4. DIRECTORATE OF PILOT TRAINING RESEARCH -- DETACHMENT 1 -- RANDOLPH AFB --
SAN ANTONIO, TEXAS

Commanding Officer

Lt Col V. J. Donahue

Proficiency and Job Analysis Division

1st Lt Nyle W. Jones, Jr.

5. DIRECTORATE OF BOMBARDMENT OBSERVER -- NAVIGATOR TRAINING RESEARCH --
DETACHMENT 2, MATHER AIR FORCE BASE -- SACRAMENTO, CALIFORNIA

Commanding Officer

Lt Col Charles W. Head, Jr.
Capt C. I. Roberts

Research Director
Dr. Edward H. Kemp

Proficiency and Job Analysis Division

Dr. Robert E. Dr.eher
Dr. L. M. Stolurow
1st Lt D. W. Rankin
B. Weiss
E. J. Wyers
Maj William F. Long

Capt Norman L. Murray
R. Brissenden
P. D. Deuel, Jr.
D. W. Lewit
P. G. Petersen

Training Methods Division

Dr. R. S. Daniel
Dr. W. H. Lichte
H. E. Bamford, Jr.

1st Lt Franklin C. Butler, Jr.
Francis D. Harding, Jr.
P. B. Porter

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1st Lt C. F. Weydert
1st Lt H. J. Zeman

Research Director
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Dr. Nicholas A. Fattu
Capt John F. Groom
Dr. Guy G. Besnard
Byron E. Fulk
E. L. Pfeidder

Job Analysis Division
Douglas S. Trabue
Dr. Jesse C. Rupe
R. V. May

Training Methods Division
James R. Berkshire
Dr. Richard W. Highland
Robert A. Swanson
Capt P. T. Dupell

Human Relations and Morale Division
Dr. Robert G. Smith, Jr.
V. M. McIntosh
John V. Moore
Charles E. Zeleny
1st Lt C. W. Hill

Technical Services Division

George B. Simon
George G. Burgess
D. Everett
Risdon J. Weston

PART II: ROSTER OF RESEARCH AND ADMINISTRATIVE PERSONNEL
30 JUNE 1952

1. HEADQUARTERS -- LACKLAND AIR FORCE BASE, TEXAS

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Col Stebbins W. Griffith

Commanding Officer

Director of Operations

Dr. Arthur W. Melton
Miss Jane E. Patterson

Director of Operations
Historian

Executive Officer

Lt Col Joel H. Yates
Lt Col M. D. Watson

Executive Officer
Administrative Assistant

Liaison Offices

Lt Col Lawson Clary, Jr.
Maj Phineas T. Bates
Lt Col J. C. McIlvoy
Mr. H. R. van Saun
Maj P. T. Dupell
Capt Keith J. Lindsay

ATRC Liaison Officer
ATRC Assistant Liaison Officer
ADC Liaison Officer
ADC Director of Research
WADF Staff Research Coordinator
TTAF Liaison Officer

Air Inspector

Capt W. C. Beneke, Jr.

Air Inspector

Deputy Director for Research

Dr. Charles W. Bray
Lt Col Elmo A. Elliott
Mr. William B. Lecznar
Capt H. E. Marsh

Deputy Director for Research
Executive Officer
Technical Aide
Administrative Assistant

Technical Training Research Division

Maj John F. Groom
Maj Donald W. Johnson
1st Lt John C. Thompson

Chief
Assistant Chief
Assistant Chief

Selection & Classification Research Division

Maj M. I. Fullerton

Chief

Technical Plans & Research Review Division

Mr. Edwin S. Ewart
Dr. Llewellyn N. Wiley
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Chief
Chief Editorial Branch
Editorial Aide
Editorial Aide

Aircrew Training Research Division
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Chief

Special Projects Division
Maj Norman H. Blitch

Chief

Deputy Director for Services
Lt Col John P. Jones
Capt J. H. Phifer, Jr.

Deputy Director for Services
Executive Officer

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Maj Robert W. Severance
1st Lt G. H. Dowler
Mr. Forrest F. Carhart, Jr.
Mr. R. L. Stricklin

Director of Publications
Publications Officer
Librarian
Technical Aide

2. PERCEPTUAL AND MOTOR SKILLS RESEARCH LABORATORY -- LACKLAND AFB, TEXAS

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1st Lt Glory A. Sturiale

Dr. Robert M. Gagne
Mr. Victor E. Montgomery

Basic Skills Division
Capt Clyde E. Noble

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Dr. John B. Reynolds
Dr. Malcolm D. Arnoult
Dr. Eugenia B. Norris
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Dr. Robert S. French

Apparatus Test & Training Devices Division
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2d Lt M. E. Story

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2d Lt R. E. Sargent
2d Lt J. M. Schwarz

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1st Lt Robert L. Erdmann

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Mr. J. W. Bowles, Jr.
Dr. Elizabeth G. French
Dr. Marvin H. Berkeley
Mr. Norman D. Bryant
Mr. Maurice Chornesky
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Dr. Michael A. Zaccaria
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Dr. Mary Agnes Gordon
Dr. Helen Tomlinson
Mr. Evan W. Pickrel
Mr. M. A. Whitcomb

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Mr. Raymond E. Christal
Mr. John A. Cox, Jr.
Dr. Jane McReynolds
Miss Lucy C. Zaccaria

Research Services Division

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2d Lt E. D. Cowley

Dr. Donald B. Du Bois

PERSONNEL RESEARCH FIELD SECTION -- PARKS AIR FORCE BASE

1st Lt J. D. Ashmore

Mr. Joseph D. Austin

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	Dr. D. E. Swisher
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Dr. Walter E. Organist
Dr. Francis E. Jones
Dr. Robert K. McKelvey

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Lt Col C. C. Smith
Capt J. E. Ward
WOJG V. E. Botkin

Administration and Services Division

2d Lt W. W. Wiggins

Job Proficiency Division

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	Mr. George G. Burgess
	Mr. John V. Moore
	Mr. E. J. Morrison
	Dr. E. Saltz
	Mr. Charles E. Zeleny
	Mr. Harold W. Richey

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	Mrs. E. W. Wilder

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	Dr. S. E. Newman

TECHNICAL TRAINING RESEARCH FIELD SECTION -- LOWRY AIR FORCE BASE

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1st Lt G. A. Mursch

Dr. Wilton P. Chase
Dr. Guy G. Besnard
Dr. Leslie J. Briggs

TECHNICAL TRAINING RESEARCH FIELD SECTION -- SCOTT AIR FORCE BASE

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Dr. Wilbert S. Ray
Dr. D. Bindra

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1st Lt C. F. Weydert

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2d Lt E. E. Kimble

Gunnery Training Division
2d Lt R. V. Brown

Dr. Myron Goldstein
Dr. Robert B. Parks
Mr. C. H. Rittenhouse
Mr. W. Lesiw

Research Services Division
1st Lt John P. Woods

Dr. V. M. Brown

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1st Lt C. W. Atchison

Dr. Robert L. French
Dr. F. M. Carp

Administration and Services Division
2d Lt J. K. Oliver

Crew Training Division
2d Lt E. L. Falk

Dr. I. A. Irwin

Crew Performance Division
2d Lt S. M. Berger
2d Lt T. F. Cloonan

Dr. D. G. Forgays
Dr. W. W. Haythorn
Dr. Leonard R. Berkowitz
Dr. Thornton B. Roby
Dr. Glen Stice
Mr. W. D. Voiers
Mr. R. I. Hall

Research Services Division
Dr. D. M. Knoell

8. PILOT TRAINING RESEARCH LABORATORY -- GOODFELLOW AIR FORCE BASE

Lt Col William V. Hagin
Capt Daniel J. Boyle

Administration and Services Division
Capt E. C. Barratt

Training Methods Division

Capt Edward J. Brown
Capt James F. Smith
1st Lt D. C. Hughes
2d Lt R. B. Prewitt

Mr. Ralph E. Flexman
Mr. A. I. Prince

Proficiency and Job Analysis Division

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Capt N. W. Jones, Jr.
Capt L. C. Menius

Dr. Robert C. Houston
Dr. E. L. Sutter

Research Services Division

Capt Albert J. Latham
2d Lt C. S. Morrill

PILOT TRAINING RESEARCH FIELD SECTION - WILLIAMS AIR FORCE BASE

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Capt Albert R. Neville, Jr.
2d Lt J. P. Crawford

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University of Southern
California

Dr. W. R. Garner
Johns Hopkins University

Robert L. Thorndike
Teachers College,
Columbia University

Dr. Everett F. Lindquist
State University of Iowa

Dr. S. Rains Wallace
Life Insurance Agency
Management Association

PART III: CHRONOLOGY AND KEY PERSONNEL
(1 July 1949 - 1 February 1954)

1 July 1949 -- HRRC established

KEY PERSONNEL AS OF 30 JUNE 1950

Commander Col John T. Fitzwater

Deputy for Research Dr. Arthur W. Melton

Directorate of Personnel Research (Lackland AFB)

Research Director Dr. John T. Dailey

Senior Military Officer Capt Glenn E. McClure

Perceptual and Motor Skills Research Laboratory (Lackland AFB)

Research Director Dr. Robert M. Gagne

Senior Military Officer 1st Lt F. W. Beekman

Directorate of Pilot Training Research (Randolph AFB)

Director Lt Col V. J. Donahue

Directorate of Bombardment Observer-Navigator Training Research (Mather AFB)

Commander Major C. W. Head, Jr.

Research Director Dr. Edward H. Kemp

Directorate of Technical Training Research (Chanute AFB)

Commander Lt Col Richard W. Faubion

Research Director Dr. Thomas W. Harrell

AUGUST 1950 -- Col Clark L. Hosmer replaced Col Fitzwater as HRRC Commander.

1950 -- Directorate at Mather AFB changed to Directorate of Aircraft Observer Training Research.

1951 -- Directorate designations changed to "Laboratory."

27 MARCH 1951 -- Added two Laboratories:

Flexible Gunnery Training Laboratory (Lowry AFB)

Combat Crew Training Research Laboratory (Randolph AFB)

JULY 1951 -- Col Stebbins W. Griffith replaced Col Hosmer as HRRC Commander.

OCTOBER 1951 -- Pilot Training Research Laboratory moved to Goodfellow AFB.

DECEMBER 1951 -- Added another Laboratory:

Air Defense Personnel and Training Research Laboratory (Ent AFB)

JUNE 1952 -- Consolidated Air Defense Personnel and Training Research Laboratory with the Aircraft Observer Training Research Laboratory at Mather AFB.

KEY PERSONNEL AS OF 30 JUNE 1952

Commander -- Col Stebbins W. Griffith

Deputy Director for Research Dr. Charles W. Bray

Director of Operations Dr. Arthur W. Melton

Perceptual and Motor Skills Research Laboratory (Lackland)
Dr. Robert M. Gagne

Personnel Research Laboratory (Lackland)
Dr. Lloyd G. Humphreys

Aircraft Observer Training Research Laboratory (Mather)
Dr. Edward H. Kemp

Technical Training Research Laboratory (Chanute)
Col Richard W. Faubion

Flexible Gunnery Training Research Laboratory (Lowry)
Maj Glenn E. McClure

Combat Crew Training Research Laboratory (Randolph)
Dr. Robert L. French

Pilot Training Research Laboratory (Goodfellow)
Lt Col William V. Hagin

AUGUST 1952 -- Col Herbert N. Cowles replaced Col Griffith as HRRC Commander.

27 NOVEMBER 1952 -- Laboratories became numbered R&D groups; e.g., Pilot Training Research Laboratory was the 3306th R&D Group and Personnel Research Laboratory was the 3300th R&D Group.

Flexible Gunnery Training Research Laboratory became the Armament Systems Training Research Laboratory.

AS OF 31 DECEMBER 1952 -- Dr. Arthur W. Melton was HRRC Technical Director.

1 APRIL 1953 -- Units of HRRC moved from Air Training Command to Air Research and Development Command (predecessor of AFSC).

1 NOVEMBER 1953 -- Dr. Charles W. Bray was redesignated Deputy Chief of Staff, Development.

Personnel Research Laboratory and Perceptual and Motor Skills Research Laboratory merged to form the 6561st R&D Group, the Personnel and Perceptual Motor Skills Research Laboratories. Commander, Major William Long. Directors of Research, Dr. Humphreys and Dr. Gagne.

1 FEBRUARY 1954 -- HRRC disestablished.

APPENDIX C: AIR FORCE PERSONNEL AND TRAINING RESEARCH CENTER (AFPTRC)

Part I: ORGANIZATION AND KEY PERSONNEL
1 FEBRUARY 1954 -- 15 APRIL 1958

Headquarters

Commander

Col Herbert N. Cowles (1 February 1954 -- July 1957)
Col James A. McKerley (1 August 1957 -- February 1958)
Col Thomas Wildes (25 February 1958 -- 15 April 1958)

Chief of Staff/Vice Commander/Deputy Commander

Lt Col Joel H. Yates (As of 1 February 1954)
Col John W. Quayle (As of 30 November 1954 -- August 1956)
Col Gilbert E. Teal (1 August 1956 -- 1957)

Technical Director

Dr. Arthur W. Melton (1 February 1954 -- 6 September 1957)
Dr. Charles W. Bray (7 September 1957 -- 16 December 1957)
Dr. Raymond D. Bowers (2 January 1958 -- 15 April 1958)

Deputy for Research and Development/Deputy Technical Director

Dr. Charles W. Bray (1 February 1954 -- 7 September 1957)

Director for Operations/Deputy Chief of Staff, Operations

Lt Col William V. Hagin (30 November 1954 -- August 1956)
Col Thomas Wildes (August 1956 -- 25 February 1958)
Lt Col Clay D. Ellis (25 February 1958 -- 15 April 1958)

AFPTRC (1 February 1954 -- 1 May 1956)

Personnel Research Laboratory (Lackland) (1 February 1954 -- 1 May 1956)

(On 1 May 1956 this Laboratory was combined with the Officer Education Research Laboratory to form the Personnel Laboratory.)

Director

Dr. Lloyd G. Humphreys (As of 1 February 1954 and October 1956)

Officer Education Research Laboratory (Maxwell) (1 February 1954 -- 1 May 1956)

Director

Col George W. Croker (As of 1 February 1954)
Col Myron F. Barlow (As of 30 November 1954)

Skills Components Research Laboratory (Lackland) (1 February 1954 -- 1 May 1956)

(On 1 May 1956 this Laboratory was combined with the Aircraft Observer Research Laboratory and the Interceptor Pilot Research Laboratory to form the Operator Laboratory.)

Director

Dr. Robert M. Gagne (Acting) (As of 1 February 1954)
Col Jack Buel (As of 30 November 1954)

Aircraft Observer Research Laboratory (Mather) (1 February 1954 -- 1 May 1956)

Director

Maj John V. Patterson, Jr. (As of 1 February 1954)
Lt Col Don H. Thwaites (As of 31 December 1955)

Technical Director

Dr. Edward H. Kemp (As of 1 February 1954)

Interceptor Pilot Research Laboratory (Tyndall) (1 February 1954 -- 1 May 1956)

Director

Maj Norman H. Blitch (As of 1 February 1954)
Maj Donald W. Johnson (As of 30 November 1954)

Armament Systems Personnel Research Laboratory (Lowry) (1 February 1954 -- 1 May 1956)

(On 1 May 1956 this Laboratory was combined with the Training Aids Research Laboratory to form the Maintenance Laboratory.)

Director

Lt Col Elmo A. Elliott (As of 1 February 1954)

Technical Director

Dr. Robert M. Gagne (As of 1 February 1954)

Training Aids Research Laboratory (Chanute) (1 February 1954 -- 1 May 1956)

Director

Col Richard W. Faubion (As of 1 February 1954)

Technical Director

Dr. Arthur A. Lumsdaine (As of 1 February 1954)

Basic Pilot Research Laboratory (Gondfellow) (1 February 1954 -- May 1955)
(This Laboratory was officially closed in May 1955.)

Director

Lt Col William V. Hagan (As of 1 February 1954)
Lt Col Thomas F. Teory (As of 30 November 1954)

Crew Research Laboratory (Randolph) (1 February 1954 -- 1 May 1956) (This Laboratory was discontinued on 1 May 1956.)

Director

Dr. Robert L. French (As of 1 February 1954)

AFPTRC (1 May 1956 - 1 April 1958)

Personnel Laboratory (Lackland) (1 May 1956 -- 1 January 1958)

(This Laboratory includes the former Personnel Research Laboratory and the Officer Education Research Laboratory. The Personnel Laboratory was reassigned to the Wright Air Development Center on 1 January 1958.)

Director

Col Myron F. Barlow (1 May 1956 -- 1 January 1958)

Technical Director

Dr. Lloyd G. Humphreys (1 May 1956 - 13 September 1957)

Dr. Abraham Carp (14 September 1957 - 1 January 1958)

Operator Laboratory (Randolph) (1 May 1956 -- 15 March 1958)

(This Laboratory includes the former Skills Components Research Laboratory, the Aircraft Observer Research Laboratory, and the Interceptor Pilot Research Laboratory. The Operator Laboratory was deactivated on 15 March 1958.)

Director

Col Jack Buehl (1 May 1956 -- November 1957)

Lt Col Carl R. Carlson (1 December 1957 -- 15 March 1958)

Technical Director

Dr. Arthur Melton (Acting, (As of 1 May 1956)

Dr. Robert L. French (Acting) (November 1956 -- April 1957)

Dr. Robert L. French (25 April 1957 -- 1957)

Mr. Edwin S. Ewart (Acting) (23 November 1957 -- 1958)

Maintenance Laboratory (Lowry) (1 May 1956 -- 15 March 1958)

(This Laboratory includes the former Armament Systems Personnel Research Laboratory and the Training Aids Research Laboratory. The Maintenance Laboratory was deactivated on 15 March 1958.)

Director

Lt Col Robert L. Beers (1 May 1956 -- August 1956)

Col Morgan Goodhart (1 August 1956 -- 1957)

Lt Col Robert C. Lewis (1 December 1957 -- 1958)

Maj Harvey C. Clymer (9 March 1958 -- 15 March 1958)

Technical Director

Dr. Robert M. Gagne (1 May 1956 -- 10 January 1958)

Office for Qualitative Personnel Requirements Information (Lackland) (This office was established on 1 May 1956 and was deactivated on 1 June 1957.)

Director

Lt Col Clay D. Ellis

Office for Social Science Programs (Randolph) (This office was established on 1 May 1956 and was deactivated on 1 June 1957.)

Director

Dr. Raymond V. Bowers

Deputy Director

Lt Col Clifton A. McClellan

PART II: AFPTRC CHRONOLOGY

1 February 1954	Air Force Personnel and Training Research Center established.
23 February 1954	AFPTRC Reg. 22-1, stating the missions and defining the responsibilities of the laboratories, issued.
10 September 1954	Major mission responsibility for qualitative personnel requirements assigned to AFPTRC.
30 September 1954	Mission responsibility for social science research on intelligence methods assigned to AFPTRC.
28 April 1955	AFPTRC directed to conduct a personnel Pilot Study of HQ ARDC.
1 May 1955	Liaison offices established at HQ Air Training Command and Wright Air Development Center.
May 1955	Integration of the Chanute and Lowry Laboratories decided upon.
7-9 July 1955	Directors' Conference to discuss reorganizational plans for AFPTRC held at Lackland Air Force Base.
July 1955	Decision made to phase out Crew Research Laboratory.

July 1955	Decision made to merge Officer Education Research Laboratory with Personnel Research Laboratory.
11 July 1955	AFPTRC management "team" began Pilot Study of personnel at HQ ARDC.
4 October 1955	Proposed organization of System Operator Laboratories submitted and approved in principle.
20 October 1955	First plan of proposed responsibilities of AFPTRC production of QPRI issued.
28 November 1955	Proposed organization of Systems Maintenance Laboratory submitted and approved in principle.
29 November 1955	AFPTRC directed to prepare long-range development plans for a continuation of management studies of HQ ARDC and ARDC centers.
7 December 1955	AFPTRC directed to appoint a "Working Group" to make a survey of teaching survival techniques.
8 December 1955	Final plan of proposed responsibilities of AFPTRC production of QPRI issued.
3 January 1956	The new Airmen Classification Battery, AC-2A, which had been under development for several years, was put into operational use by Air Training Command. Development of this battery was considered to be a major accomplishment of AFPTRC.
6 January 1956	AFPTRC submitted "Operations Plan 55-1" to ARDC, calling for reorganization of the Center into three laboratories: Personnel Systems Laboratory, Systems Maintenance Laboratory, and Systems Operator Laboratory, plus two "Offices" and field units.
3 February 1956	Arthur W. Melton, Chairman of Human Factors Subcommittee of the ARDC Aero-Sciences Long Range Planning Committee, appointed members of the Maintenance Laboratory to serve on special panels as follows: Dr. Robert M. Gagne and Dr. Ward D. Edwards, Applied Experimental Psychology Panel; Dr. Robert G. Demaree, Personnel and Manpower Panel. These persons in March prepared or revised Panel papers related to the overall Human Factors Long Range Plan.
1 May 1956	Personnel Research Laboratory, a major technical mission element of AFPTRC, was reorganized and redesignated as Personnel Laboratory, without change of station.

1 May 1956 Armament Systems Personnel Research Laboratory (Detachment 3) Lowry AFB, was redesignated as Maintenance Laboratory (Detachment 3) without change of station.

1 May 1955 Operator Laboratory (Detachment 8), designated and organized, initially, with location at Randolph Air Force Base.

1 May 1956 Aircraft Observer Research Laboratory (Detachment 1), Mather AFB, discontinued.

1 May 1956 Training Aids Research Laboratory (Detachment 2), Chanute Air Force Base, Rantoul, Illinois, discontinued.

1 May 1956 Crew Research Laboratory (Detachment 4), Randolph Air Force Base, discontinued.

1 May 1956 Interceptor Pilot Research Laboratory (Detachment 6), Tyndall Air Force Base, Florida, discontinued.

1 May 1956 Officer Education Research Laboratory (Detachment 7), Maxwell Air Force Base, Montgomery, Alabama, discontinued.

1 May 1956 Activities of above discontinued or reorganized elements were assumed by other laboratories or by the following field units established simultaneously, with assignments as shown:

Maxwell Field Unit Number 1 (Officer Education Branch) Maxwell AFB, under the Personnel Laboratory. Forbes Field Unit Number 2, Forbes AFB, Topeka, Kansas, under the Personnel Laboratory.

Chanute Field Unit Number 1, Chanute AFB, Illinois, under the Maintenance Laboratory.

March Field Unit Number 2, March AFB, California, under the Maintenance Laboratory.

Lackland Field Unit Number 1, Lackland AFB, under the Operator Laboratory.

Tyndall Field Unit Number 2, Tyndall AFB, Florida, under the Operator Laboratory.

Waltham Field Unit Number 3, Murphy Army Hospital, Waltham Massachusetts, under the Operator Laboratory.

Mather Field Unit Number 4 (Strategic Operator Branch), Mather AF8, California, under the Operator Laboratory.

Castle Field Unit Number 5, Castle AFB,
California, under the Operator Laboratory.

MacDill Field Unit Number 6, MacDill AFB, Florida, under the Operator Laboratory.

1 May 1956 Office for Qualitative Personnel Requirements
Information established as a separate staff
agency of Headquarters AFPTRC, with location at
Lackland AFB, and with no field units assigned.

1-4 June 1956 Dr. Robert S. French, Director of Maintenance Laboratory, briefed units of Strategic Air Command (SAC) on utilization of the "K-System Malfunction and Circuitry Trainer (MAC-1)" developed by that laboratory and approved for use by SAC as a major aid for training mechanics to troubleshoot the K system.

23 July 1956 Lt Col Carl R. Carlson papered as Deputy Director of Operator laboratory, Randolph Air Force Base.

1 August 1956 Col Morgan Goodhart assigned as Director of the Maintenance Laboratory, Lowry Air Force Base, Colorado, vice Lt Col Robert L. Beers, who thereupon became Deputy Director.

25 August 1956 ARDC disseminated first formal plan for the Qualitative Personnel Requirements Information Program.

16-18 October 1956 Research Planning Group on Occupational Analysis met at AFPTRC Headquarters for conference. Group consisted of USAF, Army, Navy, and civilian experts in field of personnel, manpower, and position analysis procedures with Dr. Lloyd G. Humphreys, Director of Personnel Laboratory, as Chairman.

1 November 1956 Dr. Robert L. French assigned as Director of Systems Operator Research Unit (Operator Laboratory Field Unit Nr. 1) at Lackland Air Force Base. Simultaneously, Maj Joseph J. Rosa was assigned as Deputy Director.

1 December 1956 Crew Evaluation Research Unit (Field Unit Nr. 6)

of the Operator Laboratory at MacDill AFB, Florida, discontinued. Key scientists transferred to Systems Operator Research Unit, Operator Laboratory Field Unit Nr. 1, Lackland Air Force Base, prior to 1 November 1956 to continue work in related areas of bomber and ground crew evaluation involving aircraft other than the B-47.

25 April 1957

Dr. Robert L. French assigned as Technical Director, Operator Laboratory.

6 May 1957

Western Development Division Field Extension of Maintenance Laboratory established.

1 June 1957

Office for Social Science Programs and Office for Qualitative Personnel Requirements Information discontinued as separate offices; both became Divisions under the Deputy Chief of Staff, Operations.

1 June 1957

The following Field Extensions were discontinued:

Stead Field Extension Number 2 (Survival Methods Branch), Office for Social Science Programs, Stead AFB, Reno, Nevada.

Bomber Crew Research Unit, Operator Laboratory Field Extension Number 5, Castle AFB, California.

Maxwell Field Extension Number 1 (Intelligence Methods Branch), Office for Social Science Programs, Maxwell AFB, Alabama.

30 June 1957

The following Field Extensions were discontinued:

Forbes Field Extension Number 2, Personnel Laboratory, Forbes AFB, Topeka, Kansas.

Propulsion Research Unit, Maintenance Laboratory Field Extension Number 2, Chanute AFB, Illinois.

Maxwell Field Extension Number 1 (Officer Education Branch), Personnel Laboratory, Maxwell AFB, Alabama.

15 July 1957

Substantial rumors circulated concerning deactivation of Center.

1 August 1957

Col James A. McKerley assumed command of AFPTRC, in place of Col Herbert N. Cowles, reassigned to Air University.

6 September 1957

Dr. Arthur W. Melton resigned as Technical Director of AFPTRC.

7 September 1957 Dr. Charles W. Bray assigned as Technical Director of AFPTRC.

7 September 1957 Interceptor-Pilot Research Unit, Operator Laboratory Field Extension Number 2, Tyndall AFB, Florida, discontinued.

13 September 1957 Dr. Lloyd G. Humphreys resigned as Technical Director, Personnel Laboratory.

14 September 1957 Dr. Abraham Carp assigned as Technical Director of Personnel Laboratory.

23 November 1957 Mr. Edwin S. Ewart assigned as Acting Technical Director, Operator Laboratory, Randolph AFB.

1 December 1957 Lt Col Carl R. Carlson assigned as Director, Operator Laboratory, Randolph AFB.

12 December 1957 Headquarters AFPTRC visited by team from Wright Air Development Center (WADC) to plan phase-out actions of the Center. Team headed by Col M. P. Anderson, DCS/Comptroller; Col J. A. Jack, Director of Laboratories; and Col H. Y. Stewart, Executive Officer, Directorate of Laboratories.

16 December 1957 Dr. Charles W. Bray resigned as Technical Director of the Center.

20 December 1957 Dr. Raymond V. Bowers detailed as Technical Director of AFPTRC.

1 January 1958 Personnel Laboratory reassigned to Wright Air Development Center and designated as Detachment Nr. 1, WADC (Personnel Laboratory).

2 January 1958 Dr. Raymond V. Bowers appointed Technical Director of AFPTRC.

1 February 1958 SAGE Operator Research Unit, Operator Laboratory Field Extension Nr. 3, L. G. Hanscom Field, Bedford Massachusetts, discontinued.

25 February 1958 Col Thomas Wildes assumed command of AFPTRC, in place of Col McKerley, reassigned as base commander of Holloman AFB, New Mexico.

9 March 1958 Maj Harvey C. Clymer assigned as Director, Maintenance Laboratory.

15 March 1958 The following Field Extensions were discontinued:
Systems Operator Research Unit, Operator Field Extension Nr. 1 Lackland AFB, Texas.

Bombing-Navigation Research Unit, Operator Laboratory Field Extension Nr. 4, Mather AFB, California.

Armament Research Unit, Maintenance Laboratory, Field Extension Nr. 2, March AFB, California.

15 March 1958 Maintenance Laboratory, Lowry AFB, Colorado, deactivated.

15 March 1958 Operator Laboratory, Randolph AFB, Texas, deactivated.

15 April 1958 Air Force Personnel and Training Research Center deactivated by ARDC GO 11, 27 February 1958. Functions of Center transferred to:

Personnel Laboratory, Wright Air Development Center, Lackland AFB, Texas.

Air Proving Ground Center, Eglin AFB, Florida.

Air Force Ballistic Missile Division, Inglewood, California.

Air Force Cambridge Research Center, L. G. Hanscom Field, Bedford, Massachusetts.

Air Force Missile Test Center, Patrick AFB, Florida.

Air Force Special Weapons Center, Kirtland AFB, New Mexico.

Air Force Missile Development Center, Holloman AFB, New Mexico.

Rome Air Development Center, Griffiss AFB, Rome, New York.

Wright Air Development Center, Wright-Patterson AFB, Dayton, Ohio.

Office of Scientific Research, Air Research and Development Command, Washington, D. C.

APPENDIX D. PERSONNEL LABORATORY/6570TH PERSONNEL RESEARCH LABORATORY

(1 January 1958 -- 30 June 1968)

Chronology

1 JANUARY 1958

Personnel Laboratory of AFPTRC transferred to Wright Air Development Center (WADC), Wright-Patterson AFB. Became Detachment Number One of WADC. Remained physically located at Lackland AFB.

1 JANUARY 1958 -- 1 FEBRUARY 1962

Name changed to 6570th Personnel Research Laboratory.

1958 -- 1959

Remained under WADC.

1960 -- 1961

Under Wright Air Development Division.

1961 -- 1962

Under Aeronautical Systems Division of Air Force Systems Command (formerly Air Research and Development Command).

1 FEBRUARY 1962

Transferred to the Aerospace Medical Division (AMD).

1 FEBRUARY 1962 -- 30 JUN 1968

Continued as the 6570th Personnel Research Laboratory under AMD until AFHRL was established.

Key Personnel

Director

Col Myron F. Barlow (1 January 1958 -- August 1958)
Col Fred E. Holdredge, Jr. (1 August 1958 -- May 1962)
Lt Col Albert S. Knauf (Acting) (May 1962 -- 1963)
Col John V. Patterson (1963 -- 1965)
Col James H. Ritter (1965 -- 30 June 1968)

Technical Director

Dr. Abraham Carp (1 January 1958 -- January 1965)
Dr. Edward H. Kemp (May 1965 -- 18 January 1966)
Dr. J. W. Bowles (Acting) (As of 30 June 1967)
Dr. J. W. Bowles (As of 30 June 1968)

Executive Officer

Maj John J. Felthaus, Jr. (As of 30 June 1966)
Lt Col Frank McLanathan (As of 30 June 1968)

Director of Operations

Dr. J. W. Bowles (As of 30 June 1966)
Dr. Leland D. Brokaw (Acting) (As of 30 June 1967)
Dr. Leland D. Brokaw (As of 30 June 1968)

Selection and Classification Branch/Division

Dr. Ernest C. Tupes (1 January 1958 -- 30 June 1968)

Adaptability and Quality Evaluation Branch/Division

Dr. Eli Flyer (As of 1 January 1958 and 30 June 1966)

Maj G. F. Stauffer (Acting) (As of June 1967)

Lt Col Walter F. Murphy (As of 30 June 1968)

Statistical Methodology and Analysis Branch/Division

Dr. John M. Lieman (As of 1 January 1958)

Dr. Frank B. Ford (As of 30 June 1966 and 30 June 1967)

Dr. Robert A. Bottenberg (As of 30 June 1968)

Occupational Structures Branch/Occupational Research Division

Dr. Robert M. W. Travers (As of 1 January 1958)

Dr. Raymond E. Christal (As of 30 June 1966 - 30 June 1968)

Specialty Knowledge Test Branch/Division

Lt Col Albert S. Knauf (As of 1 January 1958)

Lt Col Ralph S. Hoggatt (As of 30 June 1966 and 30 June 1967)

Mr. Stephen W. Fotis (As of 30 June 1968)

APPENDIX E: MANPOWER AND PERSONNEL BIBLIOGRAPHY*

Air Force Behavioral Science Program

Alley, W. E., & Berberich, G. L. An analysis of AFROTC detachment viability AFHRL-TR-75-18, AD-A017 797. Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory, August 1975.

Bottenberg, R. A., & Ward, J. H., Jr. Applied multiple linear regression. PRL-TDR-63-6, AD-413 128. Lackland AFB, TX: Personnel Research Laboratory, March 1963.

Brennan, S. W., & Ritchhart, K. M. A history of the Human Resources Laboratory from 1968 through 1972. Unpublished paper by Cadets Brennan and Ritchhart, Department of History, Air Force Academy, 19 June 1972.

Brokaw, L. D., & Burgess, G. G. Development of Airman Classification Battery AC-2A. AFPTRC-TR-57-1. Lackland AFB, TX: Personnel Laboratory, Air Force Personnel and Training Research Center, June 1957.

Brokaw, L. D., & Giorgia, M. J. Development of benchmark scales for Air Force officer position evaluation. PRL-TR-66-9, AD-645 055. Lackland AFB, TX: Personnel Research Laboratory, September 1966.

Brokaw, L. D., & Holdredge, F. E. Qualifying aptitude minimums as a function of recruiting and training objectives. WADD-TN-60-134, AD-238 089 Lackland AFB, TX: Personnel Research Laboratory, Wright Air Development Division, May 1960.

Christal, R. E. JAN: A technique for analyzing group judgment. PRL-TR-63-3, AD-403 813. Lackland AFB, TX: Personnel Research Laboratory, February 1963.

Christal, R. E. Officer grade requirements project: I Overview. PRL-TR-65-15, AD-622 806. Lackland AFB, TX: Personnel Research Laboratory, September 1965.

Christal, R. E. Selecting a harem -- and other applications of the policy-capturing model. PRL-TR-67-1, AD-658 025. Lackland AFB, TX: Personnel Research Laboratory, March 1967.

Cox, J. A., & Mullins, C. J. Evaluation of light plan training among AFROTC student officers. WADC-TN-59-43, AD-219 473. Lackland AFB, TX: Personnel Research Laboratory, Wright Air Development Center, July 1959.

*This bibliography is not intended to be comprehensive in its coverage of the Air Force behavioral science programs in manpower and personnel from 1948 through 1977. The papers which were cited were chosen either as landmark papers for significant new efforts or to show the flavor of the program. If specific matters of interest are of concern, the reader should review AFHRL-TR-68-124, AFHRL-TR-76-50, AFHRL-TR-78-1, AFHRL-TR-79-1, AFHRL-TR-80-1, and AFHRL-TR-81-1. These papers include the abstracts of all papers published between 1954 and 1979.

Cailey, J. T., & Gray, C. B. Postwar research on the classification of air-crew. Research Bulletin 49-2. Lackland AFB, TX: Directorate of Personnel Research, Human Resources Research Center, Air Force Military Training Center, November 1949.

Dailey, J. T., Lecznar, W. B., & Bickaw, L. D. Development of the Airman Classification Test Battery. Research Bulletin 48-4. Lackland AFB, TX: 3309th R&D Group, Indoctrination Division, November 1948.

Dieterly, D. L. Retention of officers by source of commission. PRL-TR-67-16, AD-647 590. Lackland AFB, TX: Personnel Research Laboratory, November 1967.

Downey, R. L., Jr., Hanning, F. D. & Bottenberg, R. A. Ratings by officer groups of importance and obtainability of selected job characteristics. PRL-TR-64-4, AD-437 954. Lackland AFB, TX: Personnel Research Laboratory, February 1964.

Ewing, Faye. USAF officer career intent after the first year of active duty. PRL-TR-67-10, AD-664 037. Lackland AFB, TX: Personnel Research Laboratory, August 1967.

Flyer, E. S. Factors relating to discharge for unsuitability among 1956 airman accessions to the Air Force. WADC-TN-59-201, AD-230 758. Lackland AFB, TX: Personnel Research Laboratory, Wright Air Development Center, December, 1959.

Fortuna, A. L. (Ed). Personnel research and systems development. PRL-TR-65-13, AD-666 097. Lackland AFB, TX: Personnel Research Laboratory, December 1967.

Gordon, M. A. A study in the applicability of the same minimum qualifying scores for technical schools to white males, WAF, and Negro males. HRRC-TR-53-34. Lackland AFB, TX: Personnel Research Laboratory, Human Resources Research Center, Air Force Military Training Center, November 1953.

Quinn, N., Johnson, A. L., & Kantor, J. E. Screening for adaptability to military service. AFHRL-TR-75-30. AD-014 790. Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory, May 1975.

Quinn, N., Tupes, E. C., & Alley, W. E. Cultural subgroup differences in the relationships between Air Force aptitude composites and training criteria. AFHRL-TR-70-35, AD-715 922. Lackland AFB, TX: Personnel Research Laboratory, September 1970.

Howard, J. K., & Pickrel, E. W. The validation of the Airman Classification Battery for women in the Air Force. HRRC-TR-52-5. Lackland AFB, TX: Personnel Research Laboratory, Human Resources Research Center, Air Force Military Training Center, November 1952.

Hunter, D. R. Development of an enlisted psychomotor/perceptual test battery. AFHRL-TR-75-60, AD-A020 544. Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory, November 1975.

Knight, J. M., Pope, W. H., & Polk, S. B. Integrated Simulation Evaluation Model (ISEM) of the Air Force Manpower and Personnel System: Requirements and concepts. AFHRL-TR-77-63, AD-A044 047. Brooks AFB, TX: Occupation and Manpower Research Division, Air Force Human Resources Laboratory, August 1977.

Koplyay, J. B. Field test of the weighted airman promotion system: Phase I, analysis of the promotion board component in the weighted factor system. AFHRL-TR-69-101, AD-689 751. Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory, April 1969.

Kossack, C. F., & Beckwith, R. E. The mathematics of personnel utilization models. WADC-TN-59-358, AD-229 881. Lackland AFB, TX: Personnel Research Laboratory, Wright Air Development Center, August 1959.

Madden, J. M. The method and foundations of job evaluation in the United States Air Force. ASD-TR-61-100, AD-271 372. Lackland AFB, TX: Personnel Research Laboratory, Aeronautical Systems Division, October 1961.

McGrevey, D. F., & Valentine, L. D., Jr. Validation of two aircrew psychomotor tests. AFHRL-TR-74-4, AD-777 830. Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory, January 1974.

Miller, R. E. Interpretation and utilization of scores on the Air Force Officer Qualifying Test. AFHRL-TR-69-103, AD-691 001. Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory, May 1969.

Miller, R. E. Optimal assignment of Air Force pilots. AFHRL-TR-73-59, AD-751 035. Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory, February 1974.

Morsh, J. E., & Christal, R. E. Impact of the computer on job analysis in the United States Air Force. PRL-TR-66-19, AD-656 304. Lackland AFB, TX: Personnel Research Laboratory, October 1966.

Morsh, J. E., Madden, J. M., & Christal, R. E. Job analysis in the United States Air Force. WADD-TR-61-113, AD-259 389. Lackland AFB, TX: Personnel Research Laboratory, Wright Air Development Division, February 1961.

Morsh, J. E., & Ratliff, F. R. Occupational classification in some major government agencies. WADC-TN-59-37, AD-212 540. Lackland AFB, TX: Personnel Research Laboratory, Wright Air Development Division, March 1959.

Mullins, C. J., & Usdin, E. Estimation of validity in the absence of a criterion. AFHRL-TR-70-36, AD-716 809. Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory, October 1970.

Passey, G. E., & McLaurin, W. A. Perceptual-psychomotor tests in aircrew selection: Historical review and advanced concepts. PRL-TR-64-4, AD-636 606. Lackland Air Force Base, TX: Personnel Research Laboratory, June 1966.

Ratliff, F. R., Chiorini, J. R., Curran, C. R., & Shore, C. W. Evaluating combat crew training performance using criteria of minimum performance standards. AFHRL-TR-70-50, AD-722 409. Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory, November 1970.

Torrance, E. P., Rush, C. H., Jr., Kohn, H. B., & Doughty, J. M. Factors in fighter-interceptor combat effectiveness. AFPTRC-TR-57-11, AD-146 407. Lackland AFB, TX: Personnel Laboratory, Air Force Personnel and Training Research Center, November 1957.

Travers, R. M. W. Personnel selection and classification research as a laboratory science, Educational Psychological Measurement, 1956, 16, 195-208. (Distributed separately as AFPTRC-TN-55-96, AD-098 872.) Lackland AFB, TX: Air Force Personnel and Training Research Center, July 1956.

Tupes, E. C., & Christal, R. E. Psychological tests and the selection and classification of Air Force officers. AFPTRC-TN-57-52, AD-126 383. Lackland AFB, TX: Personnel Laboratory, Air Force Personnel and Training Research Center, April 1957.

Tupes, E. C., & Christal, R. E. Stability of personality trait rating factors obtained under diverse conditions. WADC-TN-58-61, AD-151 041. Lackland AFB, TX: Personnel Research Laboratory, Wright Air Development Center, May 1958.

Valentine, L. D., Jr. Validity of the AFOQT (Form A) for prediction of student officer success in observer training. WADC-TN-58-69, AD-207 334. Lackland AFB, TX: Personnel Research Laboratory, Wright Air Development Center, December 1958.

Valentine, L. D., Jr., & Creager, J. A. Officer selection and classification tests: Their development and use. ASD-TN-61-145, AD-269 827. Lackland AFB, TX: Personnel Research Laboratory, Aeronautical Systems Division, October 1961.

Valentine, L. D., Jr., & Tupes, E. C. Officer promotion procedures: I. An analysis of officer promotion actions. PRL-TR-64-27, AD-452 943. Lackland AFB, TX: Personnel Research Laboratory, October 1964.

Vitola, B. M., & Alley, W. E. Development and standardization of Air Force composites for the Armed Services Vocational Aptitude Battery. AFHRL-TR-68-110, AD-688 222. Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory, September 1968.

Votaw, D. R., Jr., & Dailey, J. T. Assignment of personnel to jobs. Research Bulletin 52-24. Lackland AFB, TX: Personnel Research Laboratory, Human Resources Research Center, Air Force Military Training Center, August 1952.

Ward, J. H., Jr. Use of a decision index in assigning Air Force personnel.
WADC-TN-59-38, AD-214 600. Lackland AFB, TX: Personnel Research
Laboratory, Wright Air Development Center, April 1959.

Footnotes

1. Human Resources Research and Development Program for FY 1950. 1 July 1949 through 30 June 1950, p. 1.
2. History, Air Force Personnel and Training Research Center (AFPTRC). 1 February 1954 to 30 June 1954, vol I. p. xiii.
3. History, AFPTRC. 1 January 1957 to 15 April 1958, vol I. p. xv.
4. Barlow, Esther. Abstracts of Personnel Research Reports: VIII. 1954 -- 1968. AFHRL-TR-68-124. AD-695 483. Lackland AFB TX: Personnel Research Division, December 1968.
5. USAF Scientific Advisory Board Special Report, April 1967.
6. HQ AFSC Special Order (SO) G66, 26 June 1968.
7. Personnel Research Laboratory (PRL). Chronology of the Organization: 1941 -- 1967, p. 2.
8. Personal Knowledge of Author.
9. PRL, Chronology, p. 2.
10. Ibid.
11. Ibid.
12. Ibid.
13. Ibid.
14. Ibid.
15. Ibid.
16. Roster, Research and Administrative Personnel, Air Training Command, Human Resources Research Center (HRRC), 30 June 1950.
17. Ibid.
18. Ibid.
19. Ibid.
20. Ibid.
21. Ibid.
22. PRL, Chronology, p. 2.
23. History, HRRC, 1 July 1950 -- 31 December 1950, p. 2.

24. HQ HRRC General Order (GO) 28, 1 June 1951.
25. HQ HRRC GO 15, 20 March 1951.
26. HQ HRRC GO 49, 13 December 1951.
27. HQ HRRC GO 11, 27 June 1952.
28. HQ HRRC GO 48, 4 October 1951.
29. PRL, Chronology, p. 2.
30. History, HRRC, 1 January 1951 -- 30 June 1951, p. 6 and History, HRRC, 1 July 1951 -- 31 December 1951, p. 5.
31. Roster, Research and Administrative Personnel, HRRC, 30 June 1952.
32. Ibid.
33. History, HRRC, 1 January 1952 -- 30 June 1952, p. 3.
34. HQ Air Training Command (ATRC) GO 42, 18 November 1952.
35. PRL, Chronology, p. 3.
36. Air Research and Development Command (ARDC) GO 29, 27 March 1953.
37. History, HRRC, 1 July 1953 -- 31 December 1953, pp. 4-5.
38. Ibid., p. vii.
39. ARDC GO 5, 15 January 1954.
40. AFPTRC Regulation 22-1, 23 February 1954 and History, AFPTRC, 1 February 1954 -- 30 June 1954, p. 1.
41. History, AFPTRC, 1 February 1954 -- 30 June 1954, vol I, p. 9.
42. Ltr, ARDC/RDOM to Comdr HRRC, subj: "Integration of Human Resources Research activities in ARDC." 11 January 1954: and Ltr. HRRC/GC to Comdrs, Human Resources Research Institute (HRRI) and All Laboratories, subj: "Announcement of Appointments to AFP&TRC Effective 1 February." 28 January 1954.
43. AFPTRC GO 17, 20 December 1957.
44. Roster, Officer Personnel, AFPTRC, 30 November 1954.
45. History, AFPTRC, 1 July 1954 -- 31 December 1954, vol I, pp. 2-5.
46. Ibid., p. 9.
47. Ibid., Figure 4.

48. History, AFPTRC, 1 January 1955 -- 30 June 1955, vol I, p. 3.
49. Ltr. AFPTRC/PTB to ARDC/ROG, subj: "Revision of the Mission of the Officer Education Research Laboratory, Maxwell AFB." 5 April 1955.
50. History, AFPTRC, 1 January 1955 -- 30 June 1955, vol I, p. 33.
51. Ibid., pp. 34-35.
52. ARDC Regulation 22-14, 24 February 1955.
53. History, AFPTRC, 1 January 1955 -- 30 June 1955, vol I, p. xxv.
54. Ibid., p. 5.
55. Ibid., p. 8.
56. ARDC GO 11, 16 April 1956.
57. AFPTRC GO 5, 26 April 1956.
58. Personal Knowledge of Author.
59. AFPTRC GO 6, 1 May 1956.
60. AFPTRC GO 9, 1 August 1956.
61. Ibid.
62. AFPTRC GO 12, 27 August 1956.
63. AFPTRC GO 1, 11 January 1957.
64. Statistical Brief, DCS/C, HQ AFPTRC, December 1956.
65. AFPTRC GO 4, 12 April 1957.
66. AFPTRC GO 3, 5 April 1957, as amended by AFPTRC GO 7, 3 May 1957 and AFPTRC GO 10, 10 June 1957.
67. AFPTRC GO 3, 5 April 1957.
68. Ibid., and as amended by AFPTRC GO 8, 27 May 1957.
69. Ibid., and as amended by AFPTRC GO 13, 16 August 1957 and AFPTRC GO 14, 30 August 1957.
70. History, AFPTRC, 1 January 1957 -- 15 April 1958. vol I. p. I-32.
71. Ibid., p. I-36.
72. Personal Knowledge of Author.
73. History, AFPTRC, 1 January 1957 -- 15 April 1958. vol I. pp. I-44 through I-47.

74. Statistical Brief, AFPTRC, January 1957, and Strength Report, HQ AFPTRC Form 25, January 1958.
75. History, AFPTRC, 1 January 1957 -- 15 April 1958. vol I. pp. I-35 through I-37.
76. AFPTRC GO 12, 1 August 1957.
77. AFPTRC GO 15, 3 September 1957.
78. Message (Msg), AFPTRC/PTPM to ARDC, 20 December 1957.
79. Msg, 2993M, AFPTRC/PTPM to ARDC, 11 December 1957.
80. AFPTRC GO 17, 20 December 1957.
81. History, AFPTRC, 1 January 1957 -- 15 April 1958. vol I. pp. I-41.
82. AFPTRC GO 17, 20 December 1957.
83. AFPTRC GO 5, 24 April 1957.
84. AFPTRC GO 17, 20 December 1957.
85. AFPTRC GO 15, 3 September 1957.
86. Ltr, ARDC/RDSOR to Comdr, AFPTRC, Subj: "Elimination of AFPTRC as Separate ARDC Center." 10 January 1958.
87. AFPTRC GO 4, 25 February 1958.
88. AFPTRC GO 11, 27 February 1958.
89. Ltr, ARDC/RDSOR to Comdr, AFPTRC, Subj: "Elimination of AFPTRC as Separate ARDC Center." 10 January 1958.
90. Ibid.
91. Chronology, PRL, p. 3.
92. Personal Knowledge of Author.
93. History, Aerospace Medical Division (AMD), Air Force Systems Command, Reorganization, 1 November 1961 -- 30 June 1962. AFSC Historical Publication No. 62-130, volume xxxiii, School of Aviation Medicine and Successor Organizations, p. 125.
94. Ibid., p. 124.
95. Ibid., p. 126.
96. History, AMD, 1 January 1962 -- 31 December 1962, p. 54.
97. Ibid., pp 52-53.

98. History, AMD, 1 January 1963 -- 30 June 1963, p. 7.
99. Ibid., Appendix X, p. 57.
100. Chronology, AMD, 15 May 1976. p. III-4.
101. Ibid., p. III-6.
102. Personal Knowledge of Author.
103. PRL, Chronology, p. 4.
104. History, AMD, 1 January 1966 -- 30 June 1966, pp. 15-16.
105. Personal Knowledge of Author.
106. History, AMD, 1 January 1966 -- 30 June 1966, Appendix 13, p. 126.
107. Chronology, PRL, p. 4.
108. History, AMD, 1 July 1966 -- 30 June 1967, Appendix 5, p. 218.
109. Personal Knowledge of Author.
110. History, AMD, 1 July 1966 -- 30 June 1967, p. 23.
111. Ibid., p. 29
112. History, AMD, 1 July 1967 -- 30 June 1968, Appendix 8, p. 151.
113. Personal Knowledge of Author.
114. USAF Scientific Advisory Board (SAB) Report, April 1967.
115. HQ AFSC DO G66, 26 June 1968, issued in accordance with Department of the Air Force (DAF) Ltr. AFOMO 916n. 20 June 1968.
116. Ibid.
117. Msg. AFSC, 221533Z May 1969.
118. Ltr, AFSC/SCOM-26.
119. History, Air Force Human Resources Laboratory (AFHRL), 1 July 1968 -- 30 June 1972, p. 22.
120. Ibid., p. 20.
121. Ltr, MET Det 26 to AFHRL/CC, subj: "Organizational Change Request -- AFHRL." 13 August 1973.
122. Ltr, AFHRL/CC to MET Det 26, subj: "Organizational Change Request -- AFHRL." 6 December 1974.

123. Personal Knowledge of Author.
124. Histories, AFHRL, 1 July 1968 -- 30 July 1979.
125. History, AFHRL, 1 July 1968 -- 30 June 1972, p. 16.
126. Ibid.
127. Ibid, and Personal Knowledge of Author.
128. History, AFHRL, 1 July 1972 -- 30 July 1974, p. 14.
129. Personal Knowledge of Author.
130. History, AFHRL, 1 July 1972 -- 30 June 1974, p. 14.
131. History, AFHRL, 1 July 1974 -- 30 June 1975, p. 8.
132. Miller, Neal E. (Ed). Psychological Research in Pilot Training. Washington, D.C.: Government Printing Office, 1947.
133. Dailey, John T. (Ed). Psychological Research on Flight Engineer Training. Washington, D.C.: Government Printing Office, 1947.
134. Dailey, J.T., Brokaw, L.D., & Lecznar, W.B. The Development of the Airman Classification Test Battery. Barksdale AFB, LA: Headquarters Air Training Command, November 1948 (Research Bulletin 48-4).
135. Ibid.
136. Gordon, Mary A. Validity of the Airman Classification Battery (AC-14) for Career Guided Samples. Lackland AFB, TX: Human Resources Research Center, July 1951 (Research Notes PERS 51-13).
137. Dailey, J.T. Postwar Research on the Classification of Aircraf. Lackland AFB, TX: Human Resources Research Center, November 1949 (Research Bulletin 49-2).
138. History, AFPTRC, 1 January 1955 -- 30 June 1955, and AFPTRC Regulation 22-1, 23 February 1974.
139. History, AFPTRC, 1 July 1956 -- 31 December 1956, p. I-3.
140. Brennan, S.W., & Ritchhart, K.M. A History of the Human Resources Laboratory from 1968 through 1972. Unpublished manuscript, 19 June 1972.